

**REVISION OF ALYXIA (APOCYNACEAE).
PART 2: PACIFIC ISLANDS AND AUSTRALIA**

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SUMMARY

The genus *Alyxia* is revised for Australia and the islands of the Pacific Ocean as the second and final part of a complete revision of the genus. 39 species are recognised for this area of which three are new to science, two are new combinations and one is a new name. 14 species are found in Australia and its offshore territories, 21 species in New Caledonia and the Loyalty Islands, and seven species in the other islands of the Pacific. There is relatively little overlap between regions: two species are found in Malesia and Australia; one species is found in New Guinea and the Solomon Islands; one species in Vanuatu and New Caledonia; and *A. stellata* is found in Australia, New Caledonia and into the Pacific as far as Hawaii and Henderson Island. Keys and descriptions for the species are given. *Alyxia stellata* and *A. tisserantii* are particularly variable and in need of further study. The new species are *A. evansii* D.J. Middleton, *A. solomonensis* D.J. Middleton and *A. veillonii* D.J. Middleton; the new name is *A. mucronata* D.J. Middleton; and the new combinations are *A. poyaensis* (Boiteau) D.J. Middleton and *A. tropica* (P.I. Forst.) D.J. Middleton.

Key words: *Alyxia*, Apocynaceae, Australia, New Caledonia, Pacific Islands, taxonomic revision.

INTRODUCTION

This paper is the second part of a two part revision of *Alyxia* R. Br. in the Apocynaceae. A discussion of the history of the genus and of the characters has been given in Part 1 of this revision (Middleton, 2000). In that paper the species from Asia and Malesia were presented. This part of the revision includes all the species in Australia, New Caledonia and the other islands of the Pacific Ocean. This last area extends from the Solomon Islands and the Marianas northwards to Hawaii, southwards to Lord Howe Island and eastwards to Henderson Island.

New Caledonia stands out as an island with a particularly high number of species in a relatively small area. All but two species from New Caledonia and the Loyalty Islands are endemic. The island is also notable for the large variation in vegetative characters for a number of species. There have been several papers on the genus *Alyxia* in New Caledonia: some have simply been descriptions of new species or enumerations of species in either *Alyxia* or the generic synonym *Gynopogon* (Van Heurck & Müller-Argoviensis, 1870, 1871; Baillon, 1889b; Planchon, 1894; Schlechter, 1906; Guillaumin, 1911; Moore, 1921; Däniker, 1933; Guillaumin, 1957), others have been some-

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what more extensive (Guillaumin, 1941, 1948; Boiteau & Allorge, 1979). Some of the combinations in Guillaumin (1911) are not validly transferred from *Gynopogon* to *Alyxia* and the correct combinations were made in later papers. The most recent and extensive work on the Apocynaceae of New Caledonia was by Boiteau (1981) in which 31 species of *Alyxia* were recognised. He also described a number of new sections in the genus which have not been maintained here (see discussion in Middleton, 2000). In my work I have synonymised many of the species he recognised, and somewhat altered the status of other taxa, resulting in the recognition of 21 species.

Brooks et al. (1981) discuss the manganese concentration of several species of *Alyxia* in New Caledonia and suggest that some species can be characterised by their high or low accumulation of the element. Also in this area a large number of flowers from several different species have been parasitised by a gall forming insect. I have not attempted to identify the insect concerned or whether different species of insect parasitise different species of *Alyxia* but this could prove interesting for future study.

I have included many of the species recognised by Boiteau (1981) in *A. tisserantii*. These species are from his series *Globuliferae*, along with *A. celastrinea* from series *Reinwardtiana*. It would appear that Boiteau recognised many of these taxa based on characters such as peduncle length, leaf shape and size, fruit shape and size, and the pubescence or lack of it. However, all of these characters are highly plastic and variable. There is a large variation in leaf shape with the narrower-leaved forms being included in species such as *A. tisserantii*, *A. pseudoserpentina*, *A. spathulata*, *A. microcarpa*, *A. microbuxus*, *A. breviflora* and *A. discolor* and the larger-leaved variations generally being included in *A. celastrinea*. The name *A. obovata* Seem. from New Caledonia predates all of these except for *A. tisserantii* and was overlooked due to the fact that it was published in a work otherwise about Fijian plants. It encompasses the sort of variation which has generally been referred to *A. microbuxus*. Many of the reported differences in fruit shape and size (Boiteau, 1981) are due to the fact that most specimens were collected before the fruit was ripe. When ripe the articles are covered in a thin flesh and are usually black or almost black. Immature fruits are usually slightly ribbed, greenish and more globose than the mature ones, although not exclusively.

There has been some confusion over the correct authority for several names of New Caledonian species of *Alyxia*. Guillaumin (1911) published a list of the species, including the species which had originally been described in *Gynopogon*. Unfortunately he did not actually make the new combinations. Instead Guillaumin himself and Boiteau (1981) ascribed the correct publication of these combinations to Guillaumin (1941). However, Däniker (1933) discussed several of these species and, whilst ascribing the names to Guillaumin's paper from 1911, actually made these combinations in his paper. Fortunately the slightly earlier publication of these names than was previously appreciated does not change the names to be used for the species involved, only the citation of the authority. Boiteau (1981) typified several species of *Alyxia* from New Caledonia with the indication holo-, P! In most cases these Paris specimens can at best be described as lectotypes, often as the original description contained several syntypes. However, this indication is taken as a lectotypification of the Paris element and the typification is given here as 'lectotype' where appropriate. Under article 9.15 of the Saint Louis Code (Greuter et al., 2000) where Boiteau indicated Paris but did not indicate which

specimen of two or more duplicates was intended I have narrowed it down as a step 2 lectotypification of one specimen in Paris.

There have been several papers on the *Alyxia* species of Australia, including many Flora accounts. Earlier works include those by Brown (1810), who described the three most widespread species *A. spicata*, *A. ruscifolia* and *A. buxifolia*, and Bentham (1869), who did the first Flora account of the genus. More recent accounts include Stanley & Ross (1986) for south-eastern Queensland, Dashorst & Jessop (1990) for the Adelaide region, Harden & Williams (1992) for New South Wales, and Wheeler (1992) for the Kimberley region. The most recent papers on the Australian species are by Forster (1992) and Cranfield (1995) with a Flora account for all of Australia in Forster (1996).

The species recognised in this revision differ somewhat from the Flora of Australia account. I was unable to find any significant differences between *A. ruscifolia* and *A. sharpei* and instead found that the character of inrolled leaf was continuously variable from one extreme to the other, as is the indumentum on the leaf. On the other hand the two subspecies within *A. ruscifolia* that Forster described in 1992 and maintained in 1996, subspp. *tropica* and *major*, appear to me to be different enough to warrant specific status and are certainly as different from *A. ruscifolia* as *A. gynopogon*. I have raised both to specific level as *A. tropica* (P.I. Forst.) D.J. Middleton and *A. oblongata* Domin and noted that it is *A. oblongata* which also occurs in the Lesser Sunda Islands and New Guinea and not *A. tropica* as was suggested by Forster (1992) when treated as a subspecies. *Alyxia tropica* is highly distinctive with its dense pubescence on the outside of the corolla tube. The affinities of the new species *A. evansii* are somewhat obscure within this *A. ruscifolia* group. It occurs in the Northern Territories within the range of *A. tropica* but has a glabrous corolla tube and an ovary which has hairs only in a tuft between the carpels. It appears closer to *A. oblongata* but differs in the ovary and the shorter obtuse sepals. Unfortunately it is only known from the type collection. These four species are close to *A. orophila*, *A. ilicifolia*, *A. gynopogon* and *A. magnifolia* and any more detailed study of the group should include all these species.

Forster (1992, 1996) synonymised *A. obtusifolia* under *A. spicata* and included *A. thozetii* in a list of excluded names as a synonym of *A. stellata*, noting that it was probably introduced by a bird and was not native. Both species are actually synonyms of *A. stellata*, a species known from throughout the Pacific but not previously acknowledged to be native to Australia. Several other collections of this species have also been found from Australia, mostly in Port Curtis District. It differs from *A. spicata* in the simple few-flowered inflorescence and in almost always having clearly pedicellate flowers. In Australia this species also always has a glabrous inflorescence compared to the pubescent inflorescence of *A. spicata*.

The Australian offshore islands of Lord Howe Island and Norfolk Island have two and one species respectively. The two species on Lord Howe Island are *A. ruscifolia*, also found on the Australian mainland, and *A. squamulosa*, a species whose affinities would appear to be more with species in New Caledonia. The one species on Norfolk Island, *A. gynopogon*, is clearly closely related to *A. ruscifolia*, differing from it most noticeably in the lack of a long sharp mucronate leaf apex although some specimens do show a rudimentary one.

Species of *Alyxia* extend out into the Pacific as far as Henderson Island in the East and Hawaii in the North. It is very noticeable, however, that the diversity in species is

very much lower than in Malesia, New Caledonia and Australia and in this account only seven species are recognised in this area (not including the Australian territories of Norfolk Island and Lord Howe Island). One of these is a new species, *A. solomonensis*, for the Solomon Islands. There have been a number of works on the *Alyxia* species of Micronesia and eastern and northern Polynesia (including Hawaii) but as these concern only the *A. stellata* complex they are discussed further under that species. The most detailed work in the western Pacific has been for Fiji, beginning with the work of Seemann (1866) and most thoroughly with Smith (1988). Smith recognised five species and a number of varieties, several of which have now been reduced to synonymy. The *Alyxia* species of Samoa have been extensively written about by Rechinger (1910), Setchell (1924) and Christophersen (1935). In Vanuatu Guillaumin (1932) described the new species *A. efatensis* and listed an unknown *Alyxia* which I have included in *A. podocarpa*, the only species from mainland New Caledonia to also be found elsewhere. *Alyxia stellata* and *A. bracteolosa* have also been found in Vanuatu. In Tonga Yuncker (1959) enumerated just three species of which one has been synonymised. If one does not include New Caledonia there is a very rapid drop off in numbers of species going eastwards: in New Guinea there are 30 species, in the neighbouring Solomon Islands there are just four species, in Vanuatu four species, in Fiji three species, in Tonga and Samoa two species and in the rest of the Pacific only one species, *A. stellata*.

In Part 1 of this revision problematic species complexes were highlighted for future work with an admission that a study of this sort cannot hope to solve all the problems in such a large genus. The same is true in Part 2 with particularly problematic complexes around *A. stellata*, *A. tisserantii* and *A. ruscifolia*. Further discussions can be found under those species.

Collections

There are many areas where insufficient collecting may have given false impressions of the distributions of species and may even mask intermediates between species. I have seen no *Alyxia* collections from Kiribati, the Marshall Islands, the Phoenix Islands or the Line Islands although there are collections from the island groups in all directions from these. There are a few fruiting collections from Vanuatu of material I have identified as *A. podocarpa*, a species otherwise found only in New Caledonia. It would be interesting to collect flowering material of this species to confirm, or otherwise, that it is conspecific with *A. podocarpa* from New Caledonia. Also the relationship between *A. bracteolosa* and *A. efatensis* might be clarified by further collecting in Vanuatu.

SYSTEMATIC TREATMENT

ALYXIA

- Alyxia* R.Br. (1810) 469, nom. cons.; Roem. & Schult. (1819) 439; Spreng. (1817) 494; G. Don (1838) 96; A.DC. (1844) 345; Benth. & Hook.f. (1876) 697; Pichon (1948) 164. — *Alyxia* sect. *Gynopogon* Pichon (1948) 165, nom. illeg. [it included the type species of *Alyxia*]. — *Alyxia* ser. *Alyxia* Markgr. — Type species: *Alyxia spicata* R.Br.
Pulassarium [Rumph. (1747) 430, nom. inval.]; Kuntze (1891) 416, nom. illeg.
Gynopogon J.R. Forst. & G. Forst. (1775) 35, nom. rejic.; K. Schum. (1895) 151. — Type species: *Gynopogon stellata* J.R. Forst. & G. Forst.

Alexia Wight (1848) t. 1293, orth. var.

Paralstonia Baill. (1888) 750. — Type species: *Paralstonia clusiacea* Baill.

Discalyxia Markgr. (1926) 282. — *Alyxia* ser. *Discalyxia* (Markgr.) Markgr. (1977) 410; Boiteau (1981) 98. — Type species: *Discalyxia ridleyana* (Wernham) Markgr.

Alyxia ser. *Reinwardtiana* Markgr. (1977) 380; Boiteau (1981) 100. — *Alyxia* ser. *Reinwardtiana* subser. *Reinwardtiana* Markgr. (1977) 386. — Type species: *Alyxia reinwardtii* Blume.

Alyxia ser. *Reinwardtiana* subser. *Clusiaceae* Markgr. (1977) 380. — Type species: *Alyxia clusiacea* (Baill.) Pichon.

Alyxia ser. *Reinwardtiana* subser. *Pilosae* Markgr. (1977) 382. — Type species: *Alyxia pilosa* Miq.

Alyxia ser. *Defoliatae* Markgr. (1977) 398. — Type species: *Alyxia defoliata* Markgr.

Alyxia ser. *Floribundae* Markgr. (1977) 394. — Type species: *Alyxia maluensis* Markgr.

Alyxia ser. *Globuliferae* Markgr. (1977) 392; Boiteau (1981) 98. — Type species: *Alyxia concatenata* (Blanco) Merr.

Alyxia ser. *Laurinae* Markgr. (1977) 391. — Type species: *Alyxia laurina* Gaudich.

Alyxia ser. *Laxiflorae* Markgr. (1977) 406. — Type species: *Alyxia laxiflora* Merr.

Alyxia ser. *Megalocarphae* Markgr. (1977) 393. — Type species: *Alyxia scortechinii* King & Gamble.

Alyxia ser. *Microphyllae* Markgr. (1977) 404. — Type species: *Alyxia microphylla* Markgr.

Alyxia ser. *Ruscifoliae* Markgr. (1977) 412. — Type species: *Alyxia ruscifolia* R.Br.

Alyxia ser. *Subalpinae* Markgr. (1977) 402. — Type species: *Alyxia subalpina* Markgr.

Alyxia ser. *Baillonianae* Boiteau in Boiteau & L. Allorge (1979) 444; Boiteau (1981) 100. — Type species: *Alyxia baillonii* Guillaumin.

Alyxia ser. *Suaves* Boiteau in Boiteau & L. Allorge (1979) 444; Boiteau (1981) 100. — Type species: *Alyxia suavis* (Baill.) Schltr.

Alyxia ser. *Cylindrocarphae* Boiteau in Boiteau & L. Allorge (1979) 445; Boiteau (1981) 101. — Type species: *Alyxia cylindrocarpa* Guillaumin.

Alyxia ser. *Bracteolosae* A.C. Sm. (1988) 56. — Type species: *Alyxia bracteolosa* A. Gray.

Alyxia sect. *Monospermae* Tsiang & P.T. Li (1990) 27 — Type species: *Alyxia balansae* Pit.

Climbers, scramblers or shrubs. *Branchlets* mostly strongly or weakly angled when young, becoming mostly terete with age; lenticellate or not; pubescent or not. *Leaves* opposite or in whorls of 3–7, more or less equal in size, entire; colleters present in the axils; secondary venation usually only distinguishable with difficulty from the tertiary venation or not distinguishable at all, tertiary venation generally parallel to the secondary venation or somewhat reticulate, often with an intramarginal vein. *Inflorescence* of solitary flowers, or simple pleiochasia, or compound pleiochasia and then sometimes forming large terminal panicles; peduncle delicate or robust, rarely more or less absent, pubescent or glabrous; bracts usually small, sometimes rather leafy, persistent or caducous; bracteoles absent or with one, two or several bracteoles on the pedicel. Flowers 5-merous (one Malesian species sometimes 4-merous). *Sepals* erect, rarely reflexed, rarely somewhat fleshy and rarely of widely varying sizes, ovate to linear. *Corolla* actinomorphic; lobes sinistrorsely contorted in bud; tube cylindric, somewhat inflated around stamens; lobes erect, spreading or reflexed; outside and inside glabrous or pubescent. *Stamens* inserted mostly in the upper half of the corolla tube, more rarely around or just beneath the middle, not exerted from corolla throat; filaments straight, short and thin; anthers ovate, fertile for most of length; free from pistil head. Disc absent. *Ovary* of two separate carpels united into a common style; glabrous, with tufts of hair between the two carpels, pubescent in a ring around the base of the ovary, or pubescent all over; style glabrous; pistil head small, pubescent. *Ovules* several. *Fruit* a pair of drupes from each flower consisting of one or more articles with one seed,

when more than one then forming a moniliform chain; articles globose, ellipsoid or elongated, symmetrical or somewhat curved especially in the elongated articles; endocarp mostly thin and papery but occasionally much thicker and becoming tough, mesocarp fleshy, often very thinly so, exocarp thin and coloured. *Seeds* simple; ruminant or with longitudinal ridges. Embryo with flat to strongly undulate cotyledons.

106 species found from North-East India through Southern China to Taiwan and southwards through South-East Asia to Australia and eastwards through the Solomon Islands out into the Pacific west as far as Henderson Island and north to Hawaii. Part 1 of this revision suggested there were 108 species but subsequent work on the species included in Part 2 has revised that figure slightly downwards. In Australia and its offshore islands there are 14 species, in New Caledonia 21 and in the remaining Pacific Islands 7 species.

KEY TO THE SPECIES IN AUSTRALIA (INCLUDING THE AUSTRALIAN TERRITORIES OF NORFOLK ISLAND AND LORD HOWE ISLAND)

- 1a. Leaf apex clearly mucronate; shrubs 2
- b. Leaf apex not clearly mucronate; shrubs or climbers 13
- 2a. Leaf margin toothed **14. A. ilicifolia**
- b. Leaf margin not toothed 3
- 3a. Outside of corolla densely pubescent. — Northern Territories ... **38. A. tropica**
- b. Outside of corolla glabrous or with just a few hairs around the middle or top of tube. — Widespread 4
- 4a. Leaf margins strongly inrolled 5
- b. Leaf margins only weakly inrolled or not at all 7
- 5a. Inflorescences axillary, robust, flowers solitary; plants of high altitude **24. A. orophila**
- b. Inflorescences terminal or appearing terminal, mostly delicate, flowers solitary or in condensed cymes; plants of lowlands or submontane 6
- 6a. Inflorescence axes sparsely to densely puberulent; sepals densely puberulent, apex acuminate; corolla tube > 4 times as long as sepals. — Western Australia **35. A. tetanifolia**
- b. Inflorescence axes glabrous; sepals glabrous to sparsely puberulent, apex obtuse to acute; corolla tube < 4 times as long as sepals. — Queensland, New South Wales **29. A. ruscifolia**
- 7a. Mucronate leaf apex short and not sharply pointed and often abruptly apiculate/mucronate from an obtuse or even retuse apex. — Western Australia, South Australia, Victoria, Tasmania, Norfolk Island 8
- b. Mucronate leaf apex sharply pointed from an acute or acuminate leaf apex. — New South Wales, Queensland, Northern Territories; Lord Howe Island 9
- 8a. Venation frequently obscure; flowers pedicellate; anther apex < 1 mm from corolla throat; ovary at least partly puberulent. — Mainland Australia and Tasmania . . . **3. A. buxifolia**
- b. Venation weakly prominent above; flowers sessile or subsessile; anther apex > 1 mm from corolla throat; ovary glabrous. — Norfolk Island . . **12. A. gynopogon**

- 9a. Flowers clearly pedicellate, generally in a branched cyme; largest leaves 2.7–14.7 cm long 10
- b. Flowers sessile or subsessile, generally solitary or in very condensed cymes; largest leaves 1.4–7.8 cm long 11
- 10a. Stamens inserted at 0.31–0.54 of corolla tube length; sepals 0.9–2.2 times as long as wide; secondary veins at 65–75° from midrib **14. A. ilicifolia**
- b. Stamens inserted at 0.66–0.72 of corolla tube length; sepals 2–2.6 times as long as wide; secondary veins at 20–65° from midrib **19. A. magnifolia**
- 11a. Anther apex > 2 mm from corolla mouth; stamens inserted at 0.37–0.58 of corolla tube length; corolla tube 5.8–9.5 mm long 12
- b. Anther apex < 2 mm from corolla mouth; stamens inserted at 0.51–0.73 of corolla tube length; corolla tube 4.3–7.2 mm long **29. A. ruscifolia**
- 12a. Sepals 1.8–2.6 mm long, 1.4–2.6 times as long as wide, apex acute to acuminate; ovary pubescent all over. — Queensland **22. A. oblongata**
- b. Sepals c. 1.6 mm long, 1.1 times as long as wide, apex obtuse; ovary pubescent only in a tuft between the carpels. — Northern Territories **9. A. evansii**
- 13a. Rigid erect shrubs; leaf blades coriaceous 14
- b. Climbers or scandent shrubs; leaf blades coriaceous to papery 15
- 14a. Venation frequently obscure; flowers pedicellate; anther apex < 1 mm from corolla throat; ovary at least partly puberulent. — Mainland Australia and Tasmania .
..... **3. A. buxifolia**
- b. Venation weakly prominent above; flowers sessile or subsessile; anther apex > 1 mm from corolla throat; ovary glabrous. — Norfolk Island . **12. A. gynopogon**
- 15a. Flower pedicels mostly with numerous bracteoles, some pedicels with only 2 but then bracts large and leafy or lanceolate. — Lord Howe Island
..... **33. A. squamulosa**
- b. Flower pedicels mostly without bracteoles, bracts generally small and inconspicuous. — Mainland Australia 16
- 16a. Inflorescence mostly a simple pleiochasium, 2–4(–6)-flowered, glabrous (in Australia); pedicels to 23 mm long **34. A. stellata**
- b. Inflorescence generally more complex, 8–15-flowered, sparsely to densely pubescent; pedicels to 1.1 mm long 17
- 17a. Leaf apex mostly sharp acuminate, rarely to obtuse; secondary venation distinct above; fruit articles 12–15 by 11.6–13.4 mm **11. A. grandis**
- b. Leaf apex rounded to blunt acuminate; secondary venation mostly only slightly visible or obscure above (in Australia); fruit articles 7.6–13 by 6.9–11 mm ..
..... **32. A. spicata**

KEY TO THE SPECIES IN THE ISLANDS OF THE PACIFIC OCEAN
(EXCEPT NEW CALEDONIA AND THE LOYALTY ISLANDS)

- 1a. Leaves sessile. — Fiji **8. A. erythrosperma**
- b. Leaves petiolate. — Widespread 2
- 2a. Branchlets sparsely to densely puberulent 3
- b. Branchlets glabrous 5

- 3a. Leaves dark green and dull above, venation obscure beneath, usually also obscure above; fruit with 2–8 articles, densely pubescent. — Vanuatu **26. A. podocarpa**
- b. Leaves variable but generally shiny above, venation obscure to distinct beneath, not usually obscure on both surfaces; fruit with 1–3 articles, glabrous to only very sparsely pubescent. — Widespread 4
- 4a. Inflorescence puberulent, 5- or 6-flowered; corolla tube 5–7 mm long **31. A. solomonensis**
- b. Inflorescence usually glabrous, if puberulent then fewer-flowered and with shorter corolla tube **34. A. stellata**
- 5a. Bracteoles present on all pedicels 6
- b. Bracteoles absent or present on some, but not on all, pedicels of an inflorescence 7
- 6a. Bracteoles usually more than two per pedicel, sometimes reduced to one on just a few flowers; corolla tube 3.5–12.4 mm long **2. A. bracteolosa**
- b. Bracteoles one per pedicel immediately beneath the calyx; corolla tube c. 12.6 mm long **7. A. efatensis**
- 7a. Inflorescence robust; all pedicels < 2 mm long; corolla tube 8.1–11.2 mm long; leaves obovate to elliptic. — Bougainville and the Solomon Islands **16. A. kwatobaa**
- b. Inflorescence delicate; at least some pedicels in an inflorescence > 2 mm long; corolla tube 1.8–10.1 mm long; leaves only rarely obovate. — Widespread ... **34. A. stellata**

KEY TO THE SPECIES IN NEW CALEDONIA AND THE LOYALTY ISLANDS¹

- 1a. Branchlets strongly angled; leaves in whorls of 4 or 5; largest leaves 8.1–16.4 cm long; inflorescences branched several times with > 20 flowers **17. A. leucogyne**
- b. Branchlets terete to strongly angled; leaves opposite or in whorls of 3(–5); largest leaves 0.9–13 cm long; inflorescences very simple with fewer than 10 flowers or large and lax but then with opposite leaves and with < 15 flowers 2
- 2a. Leaves distinctly mucronate 3
- b. Leaves not distinctly mucronate 7
- 3a. Branchlets sparsely to densely pubescent; leaves pubescent or glabrous beneath; sparsely pubescent around the outside of the corolla tube .. **21. A. mucronata**
- b. Branchlets and leaves glabrous; corolla tube glabrous outside 4
- 4a. Inflorescences very lax, 4.8–14 cm long; pedicels 2.8–22 mm long; fruit articles somewhat sickle-shaped, 2.4–5.7 cm long **20. A. margaretae**
- b. Inflorescences variable, 1.2–3.8 cm long; pedicels 0.8–8.5 mm long; fruit articles ellipsoid or fusiform, 0.7–3.7 cm long 5
- 5a. Leaf blade papery to subcoriaceous; inflorescence 1–3-flowered; corolla tube 7.7–10.2 mm long, 5.4–8.5 times as long as sepals; fruit articles cylindrical **6. A. cylindrocarpa**
- b. Leaf blade coriaceous; inflorescence 3–11-flowered; corolla tube 3.2–7 mm long, 2.3–4.5 times as long as sepals; fruit articles ellipsoid 6

1) The key uses the characteristics for the widespread *Alyxia stellata* only as it is found in New Caledonia and the Loyalty Islands.

- 6a. Inflorescence 7–11-flowered; peduncle not strongly flattened; corolla tube 3.2–4.2 mm long, 2.3–2.5 times as long as sepals **28. A. rubricaulis**
- b. Inflorescence 3-flowered; peduncle strongly flattened; corolla tube 5.8–7 mm long, 4.1–4.5 times as long as sepals **27. A. poyaensis**
- 7a. Sepals oblong, leafy, apex rounded to obtuse; inflorescences concentrated near branch ends; corolla tube densely puberulent outside; corolla lobes densely puberulent outside; fruit articles globular, black, very fleshy . **30. A. sarasinii**
- b. Sepals ovate or lanceolate, leafy or not, if leafy then apex acute to acuminate; inflorescence position variable; corolla tube glabrous, puberulent around top of tube or only sparsely puberulent outside, corolla lobes glabrous outside; fruit articles various 8
- 8a. Inflorescence 7–11-flowered, with distinct internodes; branchlets red **28. A. rubricaulis**
- b. Inflorescence 1–6(–7)-flowered, if 7-flowered then without red branchlets; mostly without distinct internodes 9
- 9a. Flowers terminal and solitary; leaves small, 0.5–2.2 by 0.15–0.45 cm **4. A. caletioides**
- b. Flowers in inflorescences of 2 or more, if solitary then not terminal; leaves variable in size and shape 10
- 10a. Sepals 3.5–4.2 mm long; bracts lanceolate or leafy, 4–11 mm long; leaves thickly coriaceous, margins mostly strongly inrolled **5. A. clusiophylla**
- b. Sepals 0.6–3 mm long; bracts mostly deltoid or ovate, rarely lanceolate or leafy, 0.5–2.5 mm long; leaves variable 11
- 11a. Leaves dark green and dull above, venation obscure beneath, usually also obscure above; fruit with 2–8 articles, densely pubescent **26. A. podocarpa**
- b. Leaves variable but generally shiny above, venation obscure to distinct beneath, not usually obscure on both surfaces; fruit with 1–6 articles, glabrous to only very sparsely pubescent 12
- 12a. Leaf surfaces strongly discoloured, mostly with obscure venation beneath and often glaucous, corolla tube 5.5–9 mm long; fruit articles generally fusiform, 6.3–23.5 mm long **1. A. baillonii**
- b. Leaf surfaces generally only slightly discoloured if at all, venation variable, only rarely glaucous but if so then corolla tube less than 5.5 mm long; fruit articles variable 13
- 13a. Stamens inserted at 4.3–6.4 mm from corolla base 14
- b. Stamens inserted at 1–3.9 mm from corolla base 16
- 14a. Petiole 0.1–0.2 cm long; leaves reaching 1.8–3.9 cm long; inflorescence delicate, peduncle c. 0.3 mm wide; sepals 0.7–1.1 mm long, c. 1 times as long as wide; corolla lobes 1.4–1.6 by 1.3 mm wide, tube 3.7–5 times as long as lobes **23. A. oppositifolia**
- b. Petiole 0.3–1 cm long; leaves reaching 5.3–10 cm long; inflorescence robust, peduncle 1.2–1.5 mm wide; sepals 1.6–2.2 mm long, 1.5–2.2 times as long as wide; corolla lobes 2.3–4.3 by 2.3–3.1 mm wide, tube 1.6–2.8 times as long as lobes 15
- 15a. Secondary veins on leaves distinct beneath; inflorescence sparsely to densely puberulent all over; sepals densely puberulent; corolla lobes 2.3–3.5 mm long,

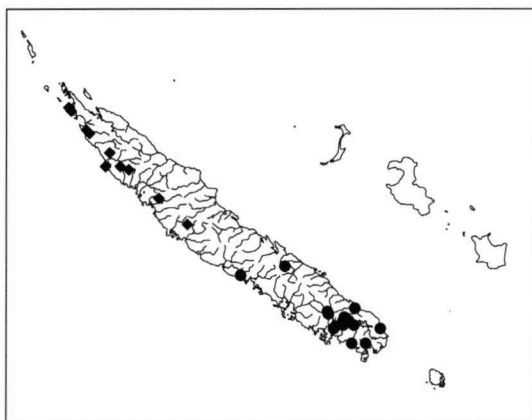
- tube 2.1–2.8 times as long as lobes; ovary densely pubescent all over
 **25. A. oubatchensis**
- b. Secondary veins on leaves only weakly visible beneath; inflorescence glabrous; sepals glabrous; corolla lobes c. 4.3 mm long, corolla tube 1.6 times as long as lobes; ovary pubescent in tuft between carpels **39. A. veillonii**
- 16a. Branchlets sparsely to densely puberulent 17
 b. Branchlets glabrous 19
- 17a. All inflorescences terminal or pseudoterminal **15. A. kaalaensis**
 b. Most inflorescences on a plant clearly axillary, occasionally also with a pseudoterminal inflorescence 18
- 18a. Leaf blade generally obovate, thickly coriaceous, often with obscure venation, often glaucous beneath; corolla tube 3.6–5.1 mm long; fruit articles 8–16 mm long **10. A. glaucophylla**
 b. Leaf blade variable but mostly not thickly coriaceous and with venation generally visible, not glaucous beneath; corolla tube 1.6–3.8(–4) mm long; fruit articles 3.5–14.5 mm long **36. A. tisserantii**
- 19a. Bracteoles present, corolla bud head ellipsoid **18. A. loesneriana**
 b. Bracteoles absent or only on pedicel of terminal flower, corolla bud head globular or ovate 20
- 20a. Fruit articles 14–20 by 7–9.5 mm, generally about 2 times as long as wide or more; ovary densely pubescent all over; inflorescence 4–6-flowered, lax
 **13. A. hurlimannii**
 b. Fruit articles 3.5–14.5 by 3.4–9 mm, mostly less than 2 times as long as wide; ovary pubescence variable; inflorescence 1–5-flowered, variable 21
- 21a. Peduncle < half length of leaf blade; fruit articles ellipsoid, if globose > 6 mm long 22
 b. Peduncle about half length of leaf blade; fruit articles globose, 5.2–6 mm long **37. A. torqueata**
- 22a. Corolla tube \leq 4 mm long. — New Caledonia **36. A. tisserantii**
 b. Corolla tube > 4 mm long. — Loyalty Islands **34. A. stellata**

1. *Alyxia baillonii* Guillaumin — Map 1

Alyxia baillonii Guillaumin (1941) 364; Boiteau (1981) 144. — *Gynopogon laurinus* Baill. (1889a) 781. — *Alyxia laurina* (Baill.) Guillaumin [(1911) 194, combination not made] ex Däniker, (1933) 381, nom. illeg.; Guillaumin (1948) 292. — Type: *B. Balansa 1403* (lecto P, designated by Boiteau, 1981; iso P) from New Caledonia, Bourail, Fené.

Alyxia cf. *leucogyne* Guillaumin (1957) 79. — Based on *Guillaumin & Baumann-Bodenheim 12582, 12636 and 15753*.

Climbers, 6–10 m high. *Branchlets* weakly angled, sparsely lenticellate or not, glabrous. *Leaves* opposite or in whorls of 3; petiole 0.3–1.4 cm long, glabrous; blade coriaceous, elliptic, obovate or spatulate, apex retuse to shortly acuminate, not mucronate, base acute to cuneate, margin weakly inrolled or flat, weakly undulate or not, pale green or glaucous beneath, 2.6–10 by 1.1–4.7 cm, 1.2–2.9 times as long as wide; midrib sunken above, intramarginal nerve absent, secondary veins 16–33 pairs, 65–75° from midrib, weakly prominent to indistinct above, obscure to weakly prominent beneath, tertiary venation weakly prominent to obscure above; glabrous beneath and above, not punctate



Map 1. Distribution of *Alyxia baillonii* Guillaumin (●) and *Alyxia caletioides* (Baill.) Guillaumin ex Däniker (◆).

beneath. *Inflorescence* 4- or 5-flowered; axillary, a simple unbranched pleiochasium or with 1 or 2 internodes and unbranched side branches, delicate or robust, glabrous or sparsely puberulent all over, 1.1–1.7 cm long; peduncle 0–0.3 cm long, 1.3 mm wide, weakly flattened; bracts persistent, deltoid, 0.9–1 by 0.7–1.4 mm; bracteoles absent or one immediately beneath calyx; pedicels 1.2–2.8 mm long. *Sepals* ovate, apex acute, not reflexed, not keeled, 1.1–1.4 by 1–1.4 mm, 1–1.1 times as long as wide, ciliate, glabrous, of similar sizes, glabrous inside. *Corolla* white or white with an orange tube; bud head 1.9–3.1 mm long, 0.25–0.29 of bud length, ellipsoid or ovate, apex acute or acuminate; tube columnar, throat with thickening, 5.5–9 mm long, 1.4–1.7 mm wide, 3.9–8.2 times as long as sepals, 2.2–3.8 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate or orbicular, apex rounded to obtuse, 2–3 by 1.6–1.9 mm, 1.1–1.6 times as long as wide, glabrous outside, pubescent at base of lobes inside, not ciliate. *Stamens* inserted at 4.2–7.2 mm from corolla base which is 0.65–0.77 of tube length; anther apex 0.4–0.7 mm from corolla mouth; anthers 1.1–1.5 by 0.4–0.5 mm, 2.6–3.25 times as long as wide; filament 0.4–0.6 mm long. *Ovary* 0.8–1 mm high, densely pubescent all over or pubescent around base only; style 3.2–6.1 mm long; pistil head 0.5–0.9 mm long. *Fruit* stalk 4–11.5 mm long, with 1–3 articles, 1–8 mm between articles, glabrous, sparsely puberulent at ends to densely puberulent all over; articles with thin flesh, 6.3–23.5 by 6–10 mm, ellipsoid or fusiform, symmetrical or asymmetrical, apex rounded to acute. *Seeds* ruminant or longitudinally ridged, 9.5–17 by 3.6–7.4 by 4.4–8 mm. Embryo linear, straight at base, 15–15.9 mm long, cotyledons 0.47–0.67 of embryo length.

Distribution — New Caledonia.

Habitat — At forest edge, in ridge forest or in wet or *Nothofagus* forest, on serpentine or ultrabasic soil, at 10–1000 m altitude.

2. *Alyxia bracteolosa* Rich. ex A. Gray — Map 2

Alyxia bracteolosa Rich. ex A. Gray (1862) 332; Setch. (1924) 58; Yunck. (1959) 219; A. C. Sm. 4 (1988) 63. — *Gynopogon bracteolosus* (Rich. ex A. Gray) K. Schum. (1895) 151. — Type: *United States Exploratory Expedition s.n.* (lecto US [78371], designated by A. C. Smith, 1988; iso GH) from Tonga, Tongatapu Island. Syntypes in GH, NY, P.

- Alyxia bracteolosa* var. *macrocarpa* A. Gray (1862) 332. — Type: *United States Exploratory Expedition s.n.* (lecto US [78369], designated by A.C. Smith, 1988) from Fiji.
- Alyxia bracteolosa* var. *angustifolia* A. Gray (1862) 332. — Type: *United States Exploratory Expedition s.n.* (lecto US [78370], designated by A.C. Smith, 1988; iso GH, P) from Tonga, Tongatapu Island. Syntype in NY.
- Alyxia bracteolosa* var. *parvifolia* A. Gray (1862) 333. — Type: *United States Exploratory Expedition s.n.* (lecto US [78368] designated by A.C. Smith, 1988; isolecto GH) from Fiji, Vanua Levu, Mathuata.
- Alyxia ovalifolia* Gillespie (1930) 17; A.C. Sm. (1988) 61. — Type: *J.W. Gillespie 4340* (holo BISH; iso BISH, UC) from Fiji, Viti Levu, Mba, Nanggaranambuluta, east of Nandarivatu.
- Alyxia erythrosperma* var. *samoensis* Christoph. (1935) 181. — *Alyxia samoensis* (Christoph.) A.C. Sm. (1988) 68. — Type: *E. Christophersen 2157* (holo BISH; iso A, BISH, BO, BRI, K, P, UC, US) from Western Samoa, Savaii, Matavanu.
- Alyxia septangularis* Christoph. (1935) 182. — Type: *E. Christophersen 3297* (holo BISH; iso A, BISH, BO, BRI, K, P, UC, US) from Western Samoa, Savaii, Siuvao-Auala.
- Alyxia bracteolosa* var. *retusa* Markgr. (1936) 125. — Type: *A.C. Smith 1775* (holo BISH; B, BISH, GH, K, NY, P, US) from Fiji, Vanua Levu, Thakaundrove, Mt Kasi, Yanawai River region.

Climbers to 30 m and with main stem 4 cm diameter (reported once as a treelet, 4 m high). *Branchlets* terete, weakly to strongly angled, sparsely lenticellate, glabrous. *Leaves* in whorls of 3; petiole 0.2–2.2 cm long, glabrous; blade coriaceous to papery, narrowly to broadly elliptic, ovate, spatulate or oblong, apex retuse to acuminate, not mucronate, base obtuse to decurrent onto petiole, margin weakly inrolled or flat, weakly undulate or not, 1.5–19 by 0.3–4.7 cm, 1.25–9.5 times as long as wide, midrib sunken above, intramarginal nerve absent or weakly present and inset from margin, secondary veins 14–68 pairs, 70–80° from midrib, weakly prominent or indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent or obscure above; glabrous beneath and above, not punctate beneath. *Inflorescence* 2–10-flowered, axillary or terminal, a simple unbranched pleiochasium, a short congested compound pleiochasium, a compound pleiochasium with distinct internodes, with 1 or 2 internodes and unbranched side branches, or of solitary flowers in the uppermost leaf axils together with a terminal simple pleiochasium, delicate or robust, glabrous to sparsely puberulent all over, 1.1–4.5 cm long; peduncle 0.2–4 cm long, 0.8–1.6 mm wide, weakly flattened; bracts caducous or persistent, deltoid, 0.4–1.7 by 0.6–1.8 mm; bracteoles mostly several along pedicel, rarely reduced to just one or two, leaving distinct scars in fruit; pedicels 0–3.2 mm long. *Sepals* ovate, apex rounded to acute, not reflexed, 1–2 by 0.6–1.8 mm, 1.1–1.7 times as long as wide, ciliate, glabrous or sparsely puberulent along centre line outside, glabrous inside. *Corolla* white, cream, yellow or with an orange tube and yellow lobes, fragrant; bud head 2.2–3.5 mm long, 0.21–0.33 of bud length, ellipsoid or ovate, apex rounded to acuminate; tube 3.5–12.4 mm long, 1–1.9 mm wide, 2.1–9.5 times as long as sepals, 2.4–6.5 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them or very sparsely pubescent beneath filaments inside; lobes elliptic, ovate or orbicular, apex rounded to acuminate, 1.2–4.1 by 0.8–3.9 mm, 0.9–1.8 times as long as wide, glabrous outside and inside, not ciliate or ciliate near tips only. *Stamens* inserted at 2.7–10.8 mm from corolla base which is 0.64–0.86 of tube length; anther apex 0.2–0.7 mm from corolla mouth; anthers 0.7–1.3 by 0.35–0.6 mm, 1.8–2.6 times as long as wide; filament 0.4–0.9 mm long. *Ovary* 0.5–1 mm high, glabrous, pubescent



Map 2. Distribution of *Alyxia bracteolosa* Rich. ex A. Gray.

around base only, rarely also very sparsely so on top, or pubescent in a tuft between the carpels; style 1.9–9.6 mm long; pistil head 0.4–0.7 mm long. *Fruit* black or purple, stalk 1–7 mm long, with 1 article, glabrous; articles with thin flesh, 10.7–38 by 8–19 mm, ellipsoid, globose or subglobose, sometimes 5-angled, symmetrical or asymmetrical, apex rounded to acuminate. *Seeds* elliptic, ruminant, 10–20 by 9.2–13 by 8.3–12 mm. Embryo cotyledons weakly undulate, c. 13.3 mm long, 0.79 of embryo length.

Distribution — Solomon Islands, Fiji, Western Samoa, American Samoa, Tonga, Vanuatu, Futuna.

Habitat — In primary or secondary ridge forest, coastal forest, rain forest, dry hillside thickets, mesophytic forest, primary montane forest, lowland forest or on rocky outcrops. On well-drained limestone, lava or calcareous ridges. At 20–1500 m altitude.

Notes — *Alyxia ovalifolia* comes well within the range of variation of *A. bracteolosa*. The inflorescences of the type are immature but the broad leaves are found in many specimens of *A. bracteolosa*. Indeed there is a very wide variation in leaf shape in this species from the broadly elliptic leaves described above to narrowly elliptic leaves. *Alyxia erythrosperma* var. *samoensis* was raised to specific level by Smith (1988) who maintained it apart from *A. bracteolosa* primarily on the shape of the fruits. The type specimen and a few other collections do have particularly strongly angled fruits and seeds but there is a continual gradation between this and the more common terete and globose fruits of *A. bracteolosa* and the taxon cannot be maintained. The 5-angled fruits are particularly common at higher altitudes (see also note under *A. erythrosperma*).

The sterile specimen *S. Griffith 11/41*, collected on Guadalcanal in the main group of the Solomon Islands, has tentatively been identified as *A. bracteolosa*. It is the only specimen of this species collected in this part of the Solomon Islands although it has also been collected in the southern Solomon Islands and Fiji. However, there is a slight possibility that this specimen is actually *A. efatensis*.

This species is possibly most closely related to *A. erythrosperma* from Fiji, *A. efatensis* from Vanuatu, and *A. concatenata* and *Alyxia sibuyanensis* from the Philippines and maybe also to *A. composita* from New Guinea and the Moluccas.

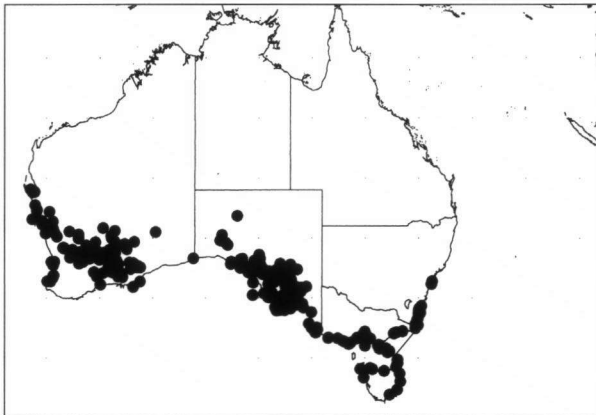
3. *Alyxia buxifolia* R.Br. — Map 3

Alyxia buxifolia R.Br. (1810) 470; Roem. & Schult. (1819) 439; Spreng. (1824) 835; G. Don (1838) 96; A.DC. (1844) 348; Benth. (1869) 307; Ewart (1930) 951; Dashorst & Jessop (1990) 118; P.I. Forst. (1992) 560; G.J. Harden & J.B. Williams (1992) 516; P.I. Forst. (1996) 129; N.G. Walsh & Entwisle (1999) 322. — *Pulassarium buxifolium* (R.Br.) Kuntze (1891) 417. — *Gynopogon buxifolius* (R.Br.) K. Schum. (1895) 151. — Type: *R. Brown Iter Australiense 2854* (lecto BM, designated by Forster, 1992; isolecoto BM, CANB, E, K, NY) from Australia, Tasmania, Kent's Group.

Alyxia capitellata Benth. (1839) 81; Lehm. (1845) 366. — Type: *C.A.A. Hügel s.n.* (holo K; iso W) from Australia, Western Australia, Swan River.

Alyxia buxifolia var. *subacuta* Domin (1913) 96. — Type: *C. Andrews 641* (lecto K, designated here; iso BM) from Australia, Swan River, Claremont near Perth.

Densely branched erect shrubs to 3 m high. *Branchlets* weakly angled, sparsely lenticellate or not, glabrous but often papillate (although there is sometimes the occasional hair around the nodes). *Leaves* opposite or in whorls of 3; petiole 0–2 cm long, glabrous; blade coriaceous, often thickly so, elliptic, ovate, or obovate, apex retuse to obtuse, mostly mucronate, sometimes so obscurely so as to appear not, base rounded to cuneate, margin weakly inrolled or flat, not undulate, dark green and shining above, pale green beneath, 0.3–5.4 by 0.2–3 cm, 1–4.8 times as long as wide, midrib flattened or slightly sunken above, intramarginal nerve absent, secondary veins 8–14 pairs, 45–50° from midrib, mostly indistinct above, occasionally to weakly prominent, obscure beneath, tertiary venation weakly prominent to obscure above; glabrous beneath and above, not punctate beneath. *Inflorescence* axillary or terminal, flowers solitary or a simple unbranched pleiochasium with up to 4 flowers, glabrous to densely puberulent, 0.8–2.1 cm long; peduncle 0–0.1 cm long; bracts c. 0.7 by 1.6 mm; bracteoles absent; pedicels 0.7–5 mm long. *Sepals* not fleshy, ovate, apex acute, not reflexed, 0.8–1.7 by 0.8–1.4 mm, 0.79–1.4 times as long as wide, ciliate, glabrous outside, pubescent only at tips or glabrous inside. *Corolla* white or white with an orange tube, fragrant; bud head 1.6–2.8 mm long, 0.25–0.31 of bud length, ovate, apex obtuse to acuminate; tube columnar, 4.4–9 mm long, 1.5–2.5 mm wide, 3.7–8.7 times as long as sepals, 1.6–3.4 times as long as lobes, glabrous outside, sparsely pubescent around stamens



Map 3. Distribution of *Alyxia buxifolia* R.Br.

and more densely in a band beneath them inside; lobes obovate, orbicular or asymmetrically orbicular with one straight side and one strongly undulate side, apex rounded to obtuse, 1.8–4.4 by 1.6–3.8 mm, 0.9–1.9 times as long as wide, glabrous outside and inside or pubescent on one side of lobe inside, ciliate or not. *Stamens* inserted at 3.3–6.5 mm from corolla base which is 0.66–0.76 of tube length; anther apex 0.2–0.5 mm from corolla mouth; anthers 0.9–1.6 mm long, 0.5–0.7 mm wide, 1.4–2.7 times as long as wide; filament 0.3–0.7 mm long. *Ovary* 0.7–1.3 mm high, pubescent around base only or pubescent in tuft between carpels; style 1.9–5.2 mm long; pistil head 0.6–1.3 mm long. *Fruit* orange, stalk 1–2.3 mm long, with 1–3 articles, 0.9–2 mm between articles, glabrous; articles fleshy or with thin flesh, 3.8–8.9 by 3.8–7 mm, ellipsoid, globose or subglobose, symmetrical, apex rounded or obtuse. *Seeds* ruminate, 3.7–5.8 by 2.9–3.7 by 3.2–3.5 mm.

Distribution — Australia (Western Australia, South Australia, Victoria, Tasmania).

Habitat — In a variety of habitats, often near the sea including cliffs and exposed ridges, littoral forest, in dunes, mallee scrub, open forest, heath and *Eucalyptus* forest. Recorded from many different soil types including limestone, sand, loam underlaid with limestone, stony brown loam, quartz rock, red-brown coarse sand and gravel over granite-quartzite, clay soil, red sandy-clay, non-calcareous sands, red loam, weathered ironstone conglomerate, yellow sandy loam and laterite, orange loamy sand, yellow-brown gravely sand, pale brown sand and red sandy clay over limestone. At 0–1000 m altitude.

Note — The fruits are reported to be sweet and edible and to be eaten by Australian aborigines. Archer (on specimen 23119111) reports that the plants on Mt Andrew in Western Australia are particularly sweet.

4. *Alyxia caletiioides* (Baill.) Guillaumin ex Däniker — Map 1

Alyxia caletiioides (Baill.) Guillaumin [(1911) 193, combination not made] ex Däniker (1933) 380; Guillaumin (1941) 364; (1948) 291; Boiteau (1981) 106. — *Gynopogon caletiioides* Baill. (1889b) 782. — Type: *B. Balansa* 3287 (lecto P, designated by Boiteau (1981); iso K, P) from New Caledonia, Mt Poum.

Erect shrubs, 0.5–1 m high. *Branchlets* weakly angled, sparsely lenticellate or not, densely brown puberulent to tomentose. *Leaves* in whorls of 3 or 4; petiole c. 1 cm long, pubescent; blade coriaceous, linear or narrowly elliptic, apex rounded to acute, not mucronate, base obtuse to cuneate, margin weakly to strongly inrolled, not undulate, dark green and shining above, pale green beneath, 0.5–2.2 by 0.15–0.45 cm, 1.75–10 times as long as wide, midrib flattened or slightly sunken above, secondary veins obscure above and beneath, tertiary venation obscure; glabrous, sparsely puberulent only on midrib or sparsely puberulent all over beneath, glabrous or puberulent only on midrib above. *Inflorescence* of terminal solitary flowers; pedicels c. 1 mm long. *Sepals* ovate, apex acute, not reflexed, 1.4–2.1 by 0.9–1.5 mm, 1.3–1.7 times as long as wide, ciliate, sparsely puberulent outside, glabrous inside. *Corolla* white; bud head 2.2–3 mm long, 0.29–0.32 of bud length, ellipsoid, apex acute; tube columnar, 5.3–8 mm long, 1.2–1.6 mm wide, 3.2–4 times as long as sepals, 2.4–3.4 times as long as lobes, glabrous outside, pubescent in upper half and around stamens or sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic or

ovate, apex rounded to obtuse, 1.7–3.3 by 0.8–1.7 mm, 1.4–2.1 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4.3–5.4 mm from corolla base which is 0.68–0.75 of tube length; anther apex 0.4–0.8 mm from corolla mouth; anthers 1.2–1.4 by 0.4–0.5 mm, 2.8–3.25 times as long as wide; filament 0.2–0.5 mm long. *Ovary* 0.5–0.7 mm high, densely pubescent all over; style 1.9–3.9 mm long; pistil head 0.5–0.7 mm long. *Fruit* black, stalk 1 mm long, with 1 or 2 articles, 0.5 mm between articles, glabrous; articles with thin flesh, 4.5–7 by 3.8–4.7 mm, ellipsoid or subglobose, symmetrical, apex rounded or obtuse. *Seed* ruminant, 3.8–4.7 by 3–3.7 by 2.5–3.3 mm. Embryo linear, straight at base, c. 4.6 mm long, cotyledons c. 37 of embryo length.

Distribution — New Caledonia.

Habitat — In maquis on serpentine soil from 100–1100 m altitude.

Note — Boiteau (1981) suggests that the flowers are subterminal but they are truly terminal in this species. Careful dissection of the base of the flowers shows clearly that the flower is terminal and any further growth of the vegetative parts is axillary rather than vice versa as has been suggested. There are several bracts and bracteoles around the base of the subsessile flower.

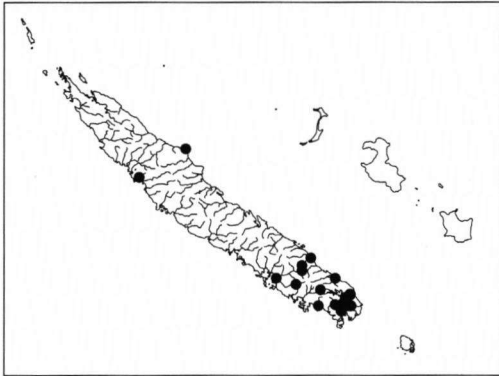
5. *Alyxia clusiophylla* (Baill.) Guillaumin ex Däniker — Map 4

Alyxia clusiophylla (Baill.) Guillaumin [(1911) 194, combination not made] ex Däniker (1933) 380; Guillaumin (1934) 458; (1948) 290; Boiteau (1981) 133. — *Gynopogon clusiophyllus* Baill. (1889b) 781. — Type: *B. Balansa 216* (lecto P, designated by Boiteau (1981), step 1, and here, step 2; iso P) from New Caledonia, Prony.

Gynopogon suavis Baill. (1889a) 775. — *Alyxia suavis* (Baill.) Schltr. (1906) 239; Guillaumin (1948) 290; Boiteau (1981) 136. — Type: *B. Balansa 2438* (lecto P, designated by Boiteau (1981), step 1, and here, step 2; iso P) from New Caledonia, Mt Humboldt.

Alyxia spec. nov. S. Moore (1921) 360. — Based on *Compton 319* (BM, K).

Shrub, erect or with arching stems, to 2 m high; bark brown, often yellowish when young. *Branchlets* weakly to strongly angled, not lenticellate, sparsely to densely puberulent, or glabrescent. *Leaves* in whorls of 3; petiole 0.4–0.7 cm long, pubescent; blade thickly coriaceous, linear, elliptic, broadly elliptic or spatulate, apex retuse to obtuse, not mucronate, base acute to decurrent onto petiole, margin weakly to strongly inrolled, not undulate, dark green and shining above, pale green or yellowish green beneath, 2.1–13 by 0.8–2.7 cm, 1.4–17.6 times as long as wide, midrib deeply sunken above, intramarginal nerve absent, secondary veins 12–20 pairs, weakly prominent or indistinct above, obscure beneath, tertiary venation obscure; sparsely puberulent only on midrib or puberulent all over beneath, glabrous or puberulent all over above. *Inflorescence* generally 4-flowered, axillary, a simple unbranched pleiochasium, robust, sparsely puberulent all over, 1.6–2 cm long; peduncle 0.6–1 cm long, 1–1.8 mm wide, weakly flattened; bracts persistent, leafy or lanceolate, 4–11 by 1.5–3.2 mm; bracteoles only on pedicel of terminal flower; pedicels 1–5.5 mm long. *Sepals* lanceolate, apex acute or acuminate, not reflexed, 3.5–4.2 by 1.1–1.4 mm, 2.5–3.8 times as long as wide, ciliate, densely puberulent outside, sometimes only on centre line, polymorphic or of similar sizes, pubescent only at tips or pubescent over upper half inside. *Corolla* white, fragrant; bud head 2.1–2.6 mm long, 0.3–0.42 of bud length, ellipsoid or ovate, apex acute; tube columnar, 3.7–5.5 mm long, 1.2–1.4 mm wide, 1–1.6 times as long



Map 4. Distribution of *Alyxia clusio-phylla* (Baill.) Guillaumin ex Däniker.

as sepals, 1.6–2.3 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, apex obtuse to acuminate, 2.2–2.3 by 1.6–1.9 mm, 1.4 times as long as wide, glabrous outside, pubescent at tips of lobes inside, ciliate near tips only. *Stamens* inserted at 3.7–4.2 mm from corolla base which is 0.67–0.72 of tube length; anther apex 0.6–0.7 mm from corolla mouth; anthers 1–1.1 by 0.4 mm, 2.5–2.75 times as long as wide; filament 0.4–0.5 mm long. *Ovary* 0.7 mm high, densely pubescent all over to pubescent around base only; style 3–3.2 mm long; pistil head 0.6–0.7 mm long. *Fruit* black, strongly ridged, very tough, stalk 0–2.8 mm long, with 1 or 2 articles, 1–1.5 mm between articles, sparsely puberulent at ends; articles fleshy, 6.5–20 by 5.3–7.5 mm, ellipsoid or subglobose, symmetrical, apex obtuse or acuminate. *Seeds* longitudinally ridged, c. 7.7 by 6.5 by 5.5 mm. Embryo linear, straight at base, c. 12 mm long, cotyledons 0.56 of embryo length.

Distribution — New Caledonia.

Habitat — Recorded from scrub, maquis and heath and on serpentine soil. Altitude 50–1100 m.

Note — In the collection *McKee* 29234, and occasionally in other collections, the terminal flower of each cyme has 6 sepals.

6. *Alyxia cylindrocarpa* Guillaumin — Map 5

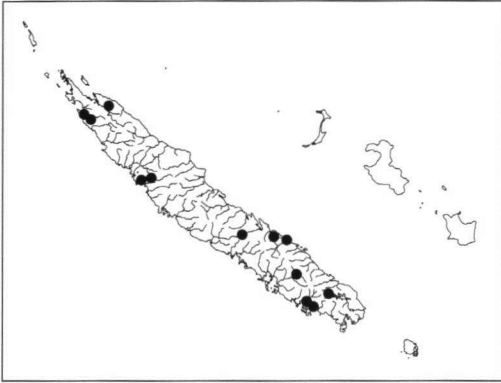
Alyxia cylindrocarpa Guillaumin (1941) 365; (1948) 292; Boiteau (1981) 156. — Type: *B. Balansa* 2426 (lecto P, designated by Boiteau (1981), step 1, and here, step 2; isolecto P) from New Caledonia, SE of Table Unio. Syntypes: *Balansa* 3012 (P), *Balansa* 1297 (P).

Alyxia spec. Guillaumin (1957) 81. — Based on *Hürlimann* 1553 (P, Z).

Alyxia spec. Guillaumin (1957) 81. — Based on *Hürlimann* 1727 (A, P, Z).

Alyxia cylindrocarpa subsp. *cylindrocarpa* var. *obtusiuscula* Boiteau in Boiteau & L. Allorge (1979) 454; Boiteau (1981) 157. — Type: *H.S. McKee* 29001 (holo P; iso L) from New Caledonia, Ouégoa, Sentier de Parari.

Climbers, erect shrubs or shrubs with arching stems, 1.5–3 m high. *Branchlets* weakly angled, sparsely lenticellate, glabrous or with the occasional hair. *Leaves* opposite; petiole 0.2–0.7 cm long, glabrous; blade subcoriaceous or papery, narrowly elliptic, elliptic or ovate, apex obtuse to acuminate, mucronate, base obtuse to cuneate, margin



Map 5. Distribution of *Alyxia cylindrocarpa* Guillaumin.

weakly inrolled or flat, weakly to strongly undulate, dark green and shining above, dark green or pale green beneath, 0.8–8.4 by 0.3–3.3 cm, 1.7–6.5 times as long as wide, midrib sunken above, intramarginal nerve strong and inset from margin, secondary veins 12–37 pairs, 70–75° from midrib, weakly prominent or indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent to obscure above; glabrous beneath and above, not punctate beneath. *Inflorescence* 1–3-flowered, axillary, terminal or pseudoterminal, flowers solitary or a simple unbranched pleiochasium, delicate, glabrous, 1.2–2.4 cm long; peduncle 0.1–0.7 cm long, 0.3–1.5 mm wide, weakly flattened; bracts persistent, deltoid, 0.7–1 by 0.5–0.6 mm; bracteoles one or two immediately beneath calyx, minute; pedicels 1.2–2.2 mm long. *Sepals* ovate, apex acute or acuminate, not reflexed, 0.9–1.6 by 0.7–1.4 mm, 1.1–1.5 times as long as wide, ciliate or not, glabrous outside, of similar sizes, glabrous inside. *Corolla* yellowish or with a pink tube and white lobes; bud head 3–6.7 mm long, 0.26–0.34 of bud length, ellipsoid or lanceolate, apex obtuse or acute; tube columnar, 7.7–10.2 mm long, 1.5–2 mm wide, 5.4–8.5 times as long as sepals, 1.8–3.2 times as long as lobes, glabrous outside, pubescent in upper half and around stamens or sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, oblong or ovate, apex acute or acuminate, 2.7–5 by 1.2–2 mm, 1.7–3.2 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 6.4–7.2 mm from corolla base which is 0.76–0.77 of tube length; anther apex 0.7–0.8 mm from corolla mouth; anthers 1.3–1.4 by 0.5 mm, 2.6–2.8 times as long as wide; filament 0.3 mm long. *Ovary* 0.9–1 mm high, densely pubescent all over or pubescent only on top; style 3.1–6 mm long; pistil head 0.7–0.8 mm long. *Fruit* stalk 2.5 mm long, with 1 or 2 articles, 2.7 mm between articles, glabrous; articles with thin flesh, 16–36.5 by 3.7–5.4 mm, narrowly ellipsoid or cylindrical, symmetrical, apex acuminate. *Seeds* longitudinally ridged, 23.2–30 by 3.6–5 by 3.1 mm. Embryo linear, straight at base, 27 mm long, cotyledons 0.7 of embryo length.

Distribution — New Caledonia.

Habitat — In wet forest or on maquis, reported from serpentine soils at 20–400 m altitude.

Note — Close to *A. margaretae* from which it differs in the much smaller inflorescences and the longer and narrower corolla lobes.

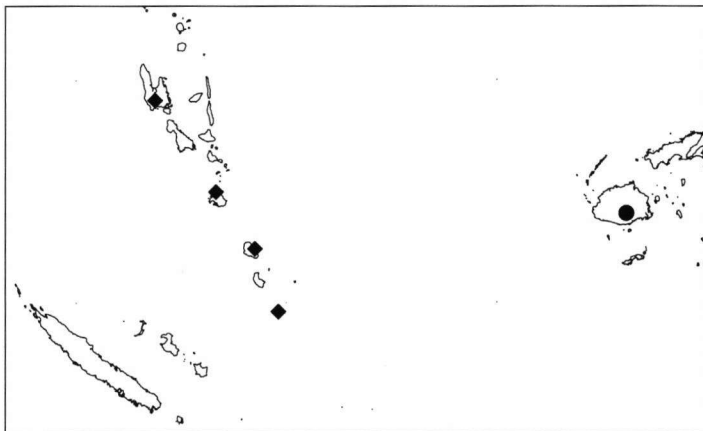
7. *Alyxia efatensis* Guillaumin — Map 6

Alyxia efatensis Guillaumin (1932) 18. — Type: *S.F. Kajewski 231* (holo P; iso A, BRI, K, NY) from Vanuatu, Efate Island, Undine Bay.

Climbers. *Branchlets* weakly angled, not lenticellate, glabrous. *Leaves* in whorls of 3; petiole 0.3–1.3 cm long, glabrous; blade coriaceous or subcoriaceous, narrowly elliptic or oblong, apex obtuse to shortly acuminate, not mucronate, base acute or cuneate, margin flat, weakly undulate or not, 2.3–10.2 by 0.8–3.1 cm, 2.1–4.6 times as long as wide, midrib sunken above, intramarginal nerve weakly present and inset from margin or absent, secondary veins 19–32 pairs, 75° from midrib, weakly distinguishable above, weakly visible beneath, tertiary venation obscure; glabrous beneath and above, not punctate beneath. *Inflorescence* axillary or terminal, of solitary flowers in the uppermost leaf axils together with a terminal simple pleiochasium of about 4 flowers, robust, glabrous, 1.9–2.4 cm long; peduncle 5.7–6.5 cm long, 1.1–1.2 mm wide, weakly flattened; bracts caducous or persistent, deltoid, 2.3 by 1.6 mm; bracteoles present, one immediately beneath calyx; pedicels 2.2–3 mm long. *Sepals* ovate, apex acute, 2.6–2.7 by 1.8–2.4 mm, 1.1–1.5 times as long as wide, ciliate, glabrous outside, of similar sizes, glabrous inside. *Corolla* yellow, not fleshy; bud head 4.3–4.8 mm long, 0.26–0.29 of bud length, ellipsoid, apex acute or acuminate; tube columnar, 12.6 mm long, 2.3 mm wide, 4.8 times as long as sepals, 2.4 times as long as lobes, glabrous outside, pubescent in a band below the stamens inside; lobes elliptic, apex acute, c. 5.2 by 2.1 mm, 2.5 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at c. 10.5 mm from corolla base which is 0.86 of tube length; anther apex 0.1 mm from corolla mouth; anthers c. 1.7 by 0.8 mm, 2.1 times as long as wide; filament 0.5 mm long. *Ovary* 1.1 mm high, glabrous or very sparsely pubescent around base only; style 9.5 mm long; pistil head 0.8 mm long. *Fruit* stalk 6 mm long, with 1 article, sparsely puberulent at ends; articles with thin flesh, c. 30 by 24 mm, subglobose, symmetrical, apex rounded.

Distribution — Vanuatu.

Habitat — In wet forest at 500–800 m altitude.



Map 6. Distribution of *Alyxia erythrosperma* Gillespie (●) and *A. efatensis* Guillaumin (◆).

Note — This species is close to *A. bracteolosa* except that it lacks the numerous bracteoles of that species and the flowers are somewhat larger. The inflorescences are concentrated at the branch ends. The label on specimen *Navian 35* reports that the sticky white sap is used for making tatoos on the skin.

8. *Alyxia erythrosperma* Gillespie — Map 6

Alyxia erythrosperma Gillespie (1930) 17; A. C. Sm. (1988) 61. — Type: *J. W. Gillespie 3219* (holo BISH; iso BISH, UC) from Fiji, Viti Levu, Namosi, between Nanggarawai and Saliandrau, Wanikoroiluva River.

Climbers. *Branchlets* strongly angled, sparsely lenticellate, glabrous. *Leaves* in whorls of 3 or 4, sessile; blade coriaceous, elliptic or obovate, apex obtuse to shortly acuminate, not mucronate, base attenuate, margin weakly inrolled or flat, weakly undulate, 10–15 by 3.9–6.2 cm, 2–2.9 times as long as wide, midrib sunken above, intramarginal nerve weakly present and inset from margin, secondary veins 25–31 pairs, 85° from midrib, weakly prominent above, distinct beneath, tertiary venation weakly visible or obscure, glabrous beneath, glabrous above, not punctate beneath. *Fruit* stalk 4–4.8 mm long, with 1 article; articles with thin flesh, 26–34 by 15–16.5 mm, ellipsoid, 5-angled, symmetrical, apex obtuse. *Seeds* oblong, ruminant, c. 22 by 11.2 by 9 mm.

Distribution — Fiji.

Habitat — Reported from 150–200 m altitude.

Note — This species is only known from the fruiting type collection and one other sterile collection without a definite location except Fiji. Its affinities are probably with *A. bracteolosa* from which it differs in the subsessile leaves and the strongly angled branchlets. Its status will have to be reviewed when more material is available. The type specimen of *A. erythrosperma* var. *samoensis* is clearly an *A. bracteolosa* but the angled fruits and seeds of the type, as in the type of *A. erythrosperma*, points to the possible affinities of the two taxa.

9. *Alyxia evansii* D. J. Middleton, *spec. nov.* — Fig. 1, Map 7

Frutex erectus. Folia 4-verticillata coriacea elliptica apice acuminato mucronato. Inflorescentiae terminales 2–5-florae glabrae circiter 1.1 cm longae. Corolla tubo circa 6.7 mm longo extus glabro lobis circa 4 mm longis. Ovarium pubescens inter carpella fasciculis positus. — Typus: *M. Evans 3371* (holo DNA; iso BRI, CANB, K) from Australia, Northern Territories, Darwin and Gulf District, Nitmiluk Amphitheatre.

Erect shrubs, to 1.5 m high. *Branchlets* weakly angled, sparsely lenticellate, densely and minutely puberulent. *Leaves* in whorls of 4; petiole 0.1–0.2 cm long, pubescent; blade coriaceous, narrowly elliptic or elliptic, apex long sharp acuminate, mucronate, base cuneate, margin weakly inrolled, not undulate, 1.1–3.2 by 0.2–0.8 cm, 4.1–7 times as long as wide, midrib flattened or slightly sunken above, intramarginal nerve absent, secondary veins 30° from midrib, indistinct above, obscure beneath, tertiary venation obscure; glabrous beneath, glabrous or puberulent only on midrib above, not punctate beneath. *Inflorescence* 2–5-flowered, terminal, a simple unbranched pleiochasium, delicate, glabrous, 1.1 cm long; peduncle 0.1 cm long, more or less terete; bracts persistent, ovate, 1.2 by 1.4 mm; pedicels 0–0.5 mm long. *Sepals* ovate, apex obtuse, not reflexed, 1.6 by 1.4 mm, 1.1 times as long as wide, ciliate, glabrous outside,

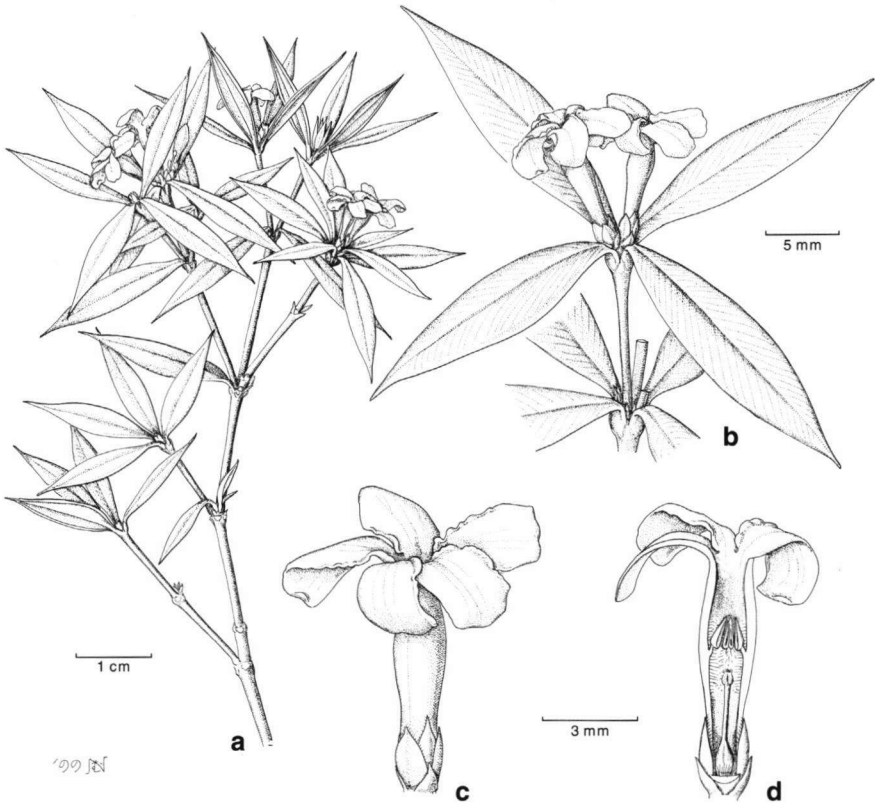


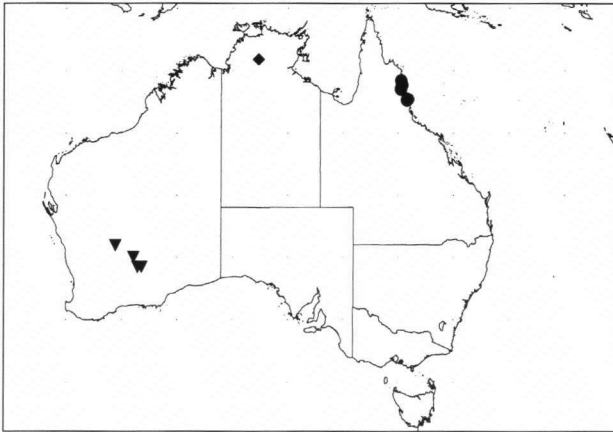
Fig. 1. *Alyxia evansii* D.J. Middleton. a. Habit; b. close up of inflorescence; c. flower; d. flower dissection (Evans 3371).

of similar sizes, glabrous inside. *Corolla* tube columnar, 6.7 mm long, 1.2 mm wide, 4.2 times as long as sepals, 1.7 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes obovate, apex obtuse, 4 by 1.5 mm, 2.7 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 3.3 mm from corolla base which is 0.46 of tube length; anther apex 2.6 mm from corolla mouth; anthers 1 by 0.4 mm, 2.5 times as long as wide; filament 0.3 mm long. *Ovary* 0.8 mm high, pubescent in a tuft between the carpels; style 2.2 mm long; pistil head 0.6 mm long. *Fruit* unknown.

Distribution — Australia (Northern Territories).

Habitat — Collected only once on drier slopes, reportedly on sandstone.

Note — This species is very clearly closely related to *A. tropica*, *A. oblongata* and *A. ruscifolia*. Like those three species it has an erect habit and strongly mucronate leaves. On first appearance it looks like *A. oblongata* but is rather in the distributional range, the Northern Territories, of *A. tropica*. It differs from *A. oblongata* in the shorter sepals and the considerably less pubescent ovary and from *A. tropica* also in the ovary and in the glabrous outside to the corolla tube. From *A. ruscifolia* it differs in the pubescence of the ovary and in the position of the stamens in the corolla tube.

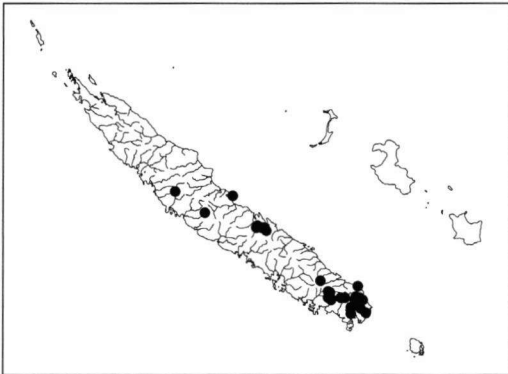


Map 7. Distribution of *Alyxia orophila* Domin (●), *A. evansii* D.J. Middleton (◆) and *A. tetanifolia* Cranfield (▼).

10. *Alyxia glaucophylla* Van Heurck & Müll.Arg. — Map 8

Alyxia glaucophylla Van Heurck & Müll.Arg. (1870) 170; Däniker (1933) 381; Guillaumin (1948) 291; Boiteau (1981) 147. — *Pulassarium glaucophyllum* (Van Heurck & Müll.Arg.) Kuntze (1891) 417. — Type: *E. Vieillard 947* (holo AWH; iso BM, G, K, P) from Canala, New Caledonia (the exact location is from the isotypes, the holotype carries no specific locality information). *Alyxia canalensis* Guillaumin (1941) 364; (1948) 292. — Type: *B. Balansa 2434* (holo P; iso P) from Canala, New Caledonia.

Climbers, erect shrubs or shrubs with arching stems, 0.5–1.3 m high. *Branchlets* weakly angled, sparsely lenticellate or not, sparsely to densely puberulent, or glabrescent. *Leaves* in whorls of 3; petiole 0.2–0.6 cm long, glabrous or pubescent; blade coriaceous or thickly coriaceous, broad elliptic, obovate or spatulate, apex emarginate to obtuse, not mucronate, base acute or cuneate, margin flat to strongly inrolled, weakly undulate or not, dark green and shining above, pale green or glaucous beneath, 1–6.1 by 0.6–3.9 cm, 0.8–4 times as long as wide, midrib flattened or sunken above, intramarginal nerve absent, secondary veins 15 or 16 pairs, weakly prominent or indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent to obscure; glabrous, sparsely puberulent only on midrib, or sparsely puberulent all over beneath and above, sometimes with a few hairs along the margin, not punctate beneath. *Inflorescence* 3–6-flowered, axillary, a simple unbranched pleiochasium or with 1 or 2 internodes and unbranched side branches, delicate or robust, sparsely to densely puberulent all over, 1.2–1.5 cm long; peduncle 0.2–0.5 cm long, 0.7–1.1 mm wide, weakly flattened; bracts caducous or persistent, deltoid, 0.7–1.5 by 0.9–1.2 mm; bracteoles absent; pedicels 1.3–3 mm long. *Sepals* ovate, apex acute, not reflexed, 1–1.5 by 0.8–1.2 mm, 1.1–1.7 times as long as wide, ciliate, sparsely to densely puberulent outside, pubescent only at tips or glabrous inside. *Corolla* white or with a pale orange tube and cream lobes; bud head ovate, apex acute; tube columnar, 3.6–5.1 mm long, 1.2–1.3 mm wide, 3–4.4 times as long as sepals, 1.8–2.3 times as long as lobes, glabrous or sparsely puberulent around top of tube outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, apex rounded, 1.9–2.6



Map 8. Distribution of *Alyxia glaucophylla* Van Heurck & Müll. Arg.

by 1.3–1.7 mm, 1.3–2 times as long as wide, glabrous outside and inside, ciliate near tips only. *Stamens* inserted at 2.7–3.6 mm from corolla base which is 0.66–0.72 of tube length; anther apex 0.2–0.4 mm from corolla mouth; anthers 0.8–0.9 by 0.3–0.5 mm, 1.8–2.7 times as long as wide; filament 0.3 mm long. *Ovary* 0.6–0.9 mm high, densely pubescent all over; style 1.7–2.6 mm long; pistil head 0.5 mm long. *Fruit* black, stalk 2.4–5 mm long, with 1–5 articles, 2.5–5 mm between articles, glabrous, sparsely puberulent at ends, or sparsely puberulent all over; articles with thin flesh, 8–16 by 5.7–12.5 mm, ellipsoid or subglobose, symmetrical, apex rounded to acuminate. *Seeds* ovoid, ruminant, 5.6–14 by 4–6.4 by 4–6.3 mm. Embryo linear, straight at base, 10.4 mm long, cotyledons 0.66 of embryo length.

Distribution — New Caledonia.

Habitat — In wet forest or in maquis scrub on serpentine soil at 150–1000 m altitude.

11. *Alyxia grandis* P.I. Forst. — Map 9

Alyxia grandis P.I. Forst. (1992) 573; (1996) 133. — Type: *P.I. Forster PIF9553* (holo BRI; iso A, B, BISH, BRI, DNA, K, NY, PERTH) from Australia, Queensland, Cook District, Kauri Creek road, c. 7.6 km from Tinaroo Dam end, State Forest 185 Danbulla.

Climbers. *Branchlets* glabrous. *Leaves* in whorls of 3 or 4; petiole 0.4–0.9 cm long, glabrous; blade coriaceous, elliptic, apex obtuse to acuminate, not mucronate, base cuneate, margin weakly inrolled, weakly undulate, 1.3–11.6 by 0.8–4.8 cm, 1.8–4.3 times as long as wide, midrib raised and with a central groove above or sunken, secondary veins 27–36 pairs, 65–70° from midrib, weakly prominent above, weakly visible beneath, tertiary venation weakly prominent above; glabrous beneath, glabrous above, not punctate beneath. *Inflorescence* 8–25-flowered, axillary, densely puberulent, 2–5 cm long; peduncle 0.7–1.9 cm long, 1.2–1.3 mm wide; bracts caducous; bracteoles present; pedicels 0.6–1.7 mm long. Calyx ovate, apex obtuse, 1.5–2 by 0.8–1.2 mm, 1.5–2.4 times as long as wide, somewhat reflexed, ciliate, densely puberulent outside, puberulent over upper half inside. *Corolla* with an orange tube and yellowish lobes; in bud with a lanceolate acute to acuminate head which is c. 0.47 of the total bud length; tube 1.9–3.8 mm long, 1.1–1.3 mm wide, 1.3–1.9 times as long as sepals, 1.1–1.5 times as long as lobes, glabrous outside or with a few hairs around the top of the tube; lobes oblong, apex rounded to obtuse, 1.7–2.5 by 0.9–1.1 mm, 1.9–2.3 times as long

as wide, glabrous outside and inside. *Stamens* inserted at 1.6–2.1 mm from corolla base which is 0.57–0.6 of tube length; anther apex 0.3–0.4 mm from corolla mouth; anthers 0.7–0.8 by 0.3–0.35 mm, 2.3 times as long as wide; filament 0.3–0.5 mm long. *Ovary* 0.5–0.6 mm high, densely pubescent all over; style 1–1.4 mm long; pistil head 0.3–0.4 mm long. *Fruit* orange or yellowish green, stalk 2.7–2.8 mm long, with 1 article; articles 18.5–21.5 by 11.6–13.4 mm, ellipsoid, apex rounded, symmetrical.

Distribution — Australia.

Habitat — In forest to 1040 m altitude.

Note — Forster (1992) notes that *A. grandis* specimens were generally labelled as *A. spicata* until he described the new species. He suggests that it is more closely related to *A. maluensis* (= *A. acuminata*) although the observations he makes of plants in the Solomon Islands probably refer to *A. solomonensis* or *A. kwalotabaa* as *A. acuminata* does not occur there. *Alyxia grandis* only bears a slight resemblance to these species in the fruit and is in fact very close to *A. spicata*, differing slightly in the foliage and in the fruit. The vegetative key character, based on the secondary venation, has to be used with care as there are some specimens in Australia of *A. spicata* where the venation is perfectly visible and even somewhat prominent and in the Lesser Sunda Islands the leaves look very like those of *A. grandis* but with the fruit of *A. spicata*. Further research is needed to really clarify the status of this species with respect to *A. spicata*.

12. *Alyxia gynopogon* Roem. & Schult. — Map 9

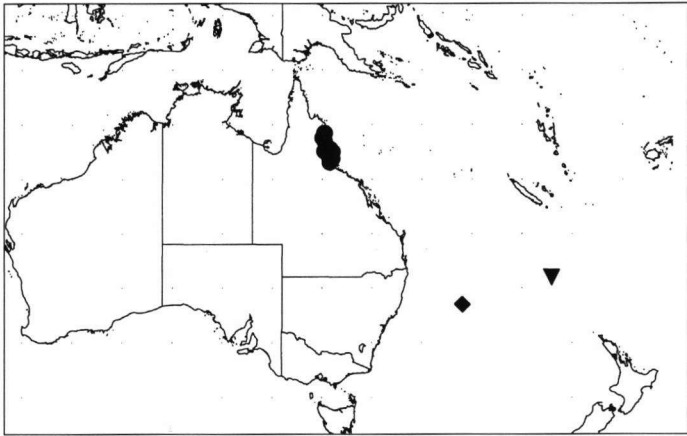
Alyxia gynopogon Roem. & Schult. (1819) 440; G. Don (1838) 96; A. DC. (1844) 347; P.S. Green (1994) 228. — *Gynopogon alyxia* G. Forst. (1786) 19. — *Pulassarium alyxia* (G. Forst.) Kuntze (1891) 417. — Type: *J.R. & G. Forster s.n.* (lecto K, designated by Green (1994); iso K) from Norfolk Island.

Alyxia daphnoides A. Cunn. (1834) t. 3313; G. Don (1838) 96; A. DC. (1844) 347. — *Pulassarium daphnoides* (A. Cunn.) Kuntze (1891) 417. — Type: *Kew Cultivated s.n.* (holo K).

Alyxia forsteri A. Cunn. ex Loudon (1835) 580, nom. nud. (see note).

Alyxia pubescens Turrill (1956) t. 266. — Type: *Kew Cultivated s.n.* (lecto K, designated here; iso K).

Erect shrubs or treelets, to 4.5 m high. Bark mottled pale and whitish grey, smooth. *Branchlets* strongly angled, not lenticellate, glabrous to densely and minutely puberulent. *Leaves* in whorls of 3 or 4; petiole 0.1–0.2 cm long, glabrous to pubescent, blade coriaceous, elliptic, ovate or obovate, apex obtuse to acuminate, minutely mucronate or not apparently so, base acute to cuneate, margin weakly inrolled or flat, not undulate, 1.2–6.1 by 0.4–3.5 cm, 1.5–4.3 times as long as wide, midrib slightly sunken above, intramarginal nerve absent, secondary veins 11–18 pairs, 30–55° from midrib, weakly prominent and distinct above, obscure to weakly visible beneath, tertiary venation weakly prominent or flattened above, branching off from secondary veins, glabrous, sparsely puberulent only on midrib or puberulent all over beneath, glabrous, puberulent only on midrib or puberulent all over above, not punctate beneath. Flowers solitary, in a ring around the nodes, pedicels 0–0.1 mm long. *Sepals* ovate, apex acute, not reflexed, not keeled, 1.4 by 1–1.4 mm, 1–1.4 times as long as wide, ciliate or not, glabrous or sparsely puberulent, of similar sizes, glabrous inside. *Corolla* bud head ovate, apex acute; tube columnar or slightly inflated, throat with thickening, 4–8 mm



Map 9. Distribution of *Alyxia grandis* P.I. Forst. (●), *A. squamulosa* C. Moore & F. Muell. (◆) and *A. gynopogon* Roem. & Schult. (▼).

long, 1.3–1.6 mm wide, 3.2–5.7 times as long as sepals, 1.7–3 times as long as lobes, glabrous or sparsely puberulent around top of tube outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic or orbicular, apex rounded to obtuse, 2–4.2 by 1.5–2 mm, 1.3–2.1 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4.9 mm from corolla base which is 0.63 of tube length; anther apex 1.6 mm from corolla mouth; anthers 0.9 by 0.5 mm, 1.8 times as long as wide; filament 0.8 mm long. *Ovary* 1 mm high, glabrous; style 3.3 mm long; pistil head 0.6 mm long. *Fruit* red, with 1 or 2 articles, sparsely puberulent at ends; articles with thin flesh, 10–13 by 5–6.5 mm, ellipsoid, symmetrical, apex rounded to acute. *Seeds* ruminant, 8–8.6 by 4.2–4.4 by 3.7–4 mm.

Distribution — Norfolk Island.

Habitat — In scrub or low forest from 30–200 m altitude growing on loam on basalt or on volcanic slopes.

Notes — One collection, *Cunningham 50* (BR, MEL, U), has 'New Zealand' on the hand-written labels and no other information. This may be a mistake and, if not, then no other information is available as to whether this species does indeed occur naturally in New Zealand.

The collection *Cunningham 30* from Norfolk Island (but see note under *A. ruscifolia*) has the name *A. forsteri* on it. This name was never validly published but this specimen is possibly the basis of the name, later taken up by Loudon. The label may also suggest that Cunningham merely meant to make a new name in *Alyxia* of *Gynopogon alyxia* although, even if this were the case, by the time Loudon published the epithet it was already a superfluous name.

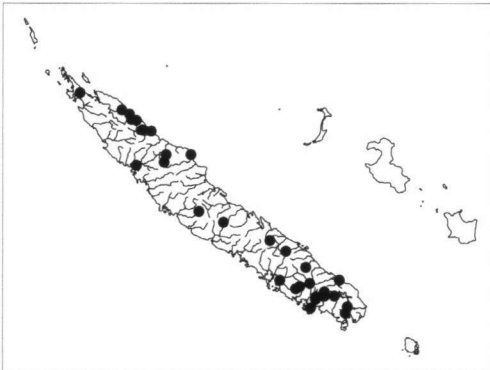
13. *Alyxia hurlimannii* Guillaumin — Map 10

Alyxia hurlimannii Guillaumin (1957) 78; Boiteau (1981) 146. — Type: *H. Hürlimann 1407* (lecto Z, designated by Boiteau (1981), step 1, and here, step 2; isolecto P, Z) from New Caledonia, between Mt Dzumac & Mt Ouin. Syntypes: *H. Hürlimann 1742* (A, NY, P, US, Z), *A. Guillaumin & M. G. Baumann-Bodenheim 11294* (P, Z).

Alyxia baumannii Guillaumin (1957) 76. — Type: *M. G. Baumann-Bodenheim 15472* (lecto P, designated here; iso A, NY, US, Z) from New Caledonia, Mt Humboldt.

Alyxia clusiophylla auct. non (Baill.) Guillaumin: S. Moore (1921) 359. — Based on *R. H. Compton 625* (BM, K).

Erect shrubs or climbers to 4 m high. *Branchlets* weakly to strongly angled, sparsely lenticellate, glabrous. *Leaves* in whorls of 3 or 4; petiole 0.3–0.5 cm long, glabrous; blade coriaceous, narrowly elliptic or obovate, apex emarginate to obtuse, sometimes apiculate or truncate, not mucronate, base cuneate or decurrent onto petiole, margin weakly inrolled or flat, weakly undulate or not, dark green and shining above, pale green beneath, 1.6–6.5 by 0.3–2.6 cm, 1.7–11.2 times as long as wide, midrib sunken or raised and with a central groove above, intramarginal nerve distinct at margin or absent, secondary veins 12–26 pairs, 75–80° from midrib, weakly prominent above, obscure to weakly prominent beneath, tertiary venation weakly prominent above, reticulate or parallel to secondary veins; glabrous beneath, glabrous above, not punctate beneath. *Inflorescence* 4–6-flowered, axillary, a simple unbranched pleiochasium or with 1 or 2 internodes and unbranched side branches, glabrous, 0.8–1.7 cm long; peduncle 0.1–0.7 cm long, 0.6–0.8 mm wide, weakly flattened; bracts caducous or persistent, deltoid, 0.6–1 by 0.6–1.2 mm; bracteoles absent or one on pedicel of terminal flower; pedicels 0.9–3.8 mm long. *Sepals* ovate, apex acute, 0.6–1 by 0.7–1.2 mm, 0.75–1.3 times as long as wide, ciliate, glabrous outside, polymorphic or of similar sizes, glabrous inside. *Corolla* white, cream, or with a yellowish tube and white lobes, fragrant; bud head 1.1–1.4 mm long, 0.32–0.38 of bud length, ovate, apex obtuse; tube columnar or slightly inflated, 2.3–3 mm long, 0.9–1.4 mm wide, 2.6–4.5 times as long as sepals, 1.2–2.1 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes obovate, orbicular or asymmetrically rhomboid with one side angled the other rounded or almost flat, apex rounded, 1.1–2.6 by 1–1.9 mm, 1–1.4 times as long as wide, glabrous outside and inside, ciliate near tips only. *Stamens* inserted at 1.4–1.6 mm from corolla base which is 0.48–0.59 of tube length; anther apex 0.3–0.5 mm from corolla mouth; anthers 0.7–0.9 by 0.3–0.4 mm, 2.25–2.5 times as long as wide; filament 0.3–0.4 mm long. *Ovary* 0.6–0.9 mm high, densely pubescent all over; style 0.6–0.8 mm long; pistil head 0.3–0.4 mm long. *Fruit* stalk 2.6–4.8 mm long; with 1 or 2 articles, 3.7 mm between articles; articles with thin flesh, 14–20 by 7–9.5 mm, ellipsoid or fusiform,



Map 10. Distribution of *Alyxia hurlimannii* Guillaumin.

symmetrical, obtuse, glabrous or sparsely puberulent all over. *Seeds* oblong, ruminant, 12.8–15 by 5.7–18 by 5.5–8 mm.

Distribution — New Caledonia.

Habitat — In wet or montane forest or in maquis on schists, ultrabasic or serpentine soils at 150–1650 m altitude.

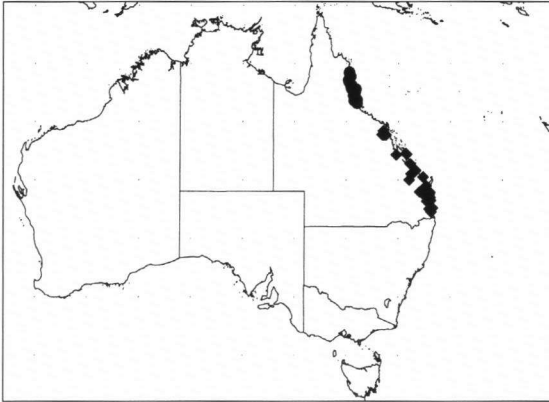
Notes — This species may be confused with the broader-leaved specimens of *A. tisserantii* (i.e. the specimens formerly placed in *A. celastrinea*) but the leaves of *A. hurlimannii* tend to be more obovate in the mature state, the inflorescence is generally somewhat laxer and the fruits are very much larger and of a different shape.

Boiteau (1981) suggested that *Hürlimann 1407* is the holotype but as the original description contains three syntypes a lectotype must be chosen. Boiteau designated the 'holotype' as being in Zurich but there are two specimens there from which I have designated one as the lectotype.

14. *Alyxia ilicifolia* F. Muell. — Map 11

Alyxia ilicifolia F. Muell. (1864) 149; Benth. (1869) 308; P.I. Forst. (1992) 565; (1996) 130. — *Pulassarium ilicifolium* (F. Muell.) Kuntze (1891) 417. — *Gynopogon ilicifolius* (F. Muell.) K. Schum. (1895) 151. — Type: *Dallachy 74* (lecto MEL, designated by Forster (1992); iso K (but without number)) from Australia, Queensland, Cook District, Rockingham Bay.

Erect shrubs or treelets, 1.2–5 m high. Bark grey, smooth. *Branchlets* weakly angled, sparsely lenticellate or not, glabrous or sparsely puberulent, minutely spiny. *Leaves* in whorls of 3 or 4; petiole 0.1–0.6 cm long, glabrous; blade coriaceous, elliptic, broad elliptic or obovate, apex long sharp acuminate, mucronate, base subcordate to cuneate, margin flat, not to strongly undulate, dark green and shining above, pale green beneath, 1–14 by 0.5–6.6 cm, 1.3–3.7 times as long as wide, midrib deeply sunken above, intramarginal nerve distinct at margin, secondary veins 27–70 pairs, 65–75° from midrib, distinct or only weakly distinguishable above, weakly prominent beneath, tertiary venation weakly prominent or flattened above, reticulate, parallel to secondary veins, or branching off from secondary veins; glabrous beneath, glabrous above, not punctate beneath. *Inflorescence* 3–7-flowered, axillary and terminal, a simple unbranched pleiochasium or with 1 or 2 internodes and unbranched side branches, glabrous to densely puberulent, 1.1–3 cm long; peduncle 0.1–1.2 cm long, 1.1–1.5 mm wide, weakly flattened or more or less terete; bracts caducous or persistent, deltoid or lanceolate, 1.2–2.4 by 1–1.6 mm wide; bracteoles present, two immediately beneath calyx or two on pedicel; pedicels 1–4 mm long. *Sepals* ovate or lanceolate, apex acute to acuminate, not reflexed, keeled or not keeled, 1.3–2.8 by 0.8–1.8 mm, 0.9–2.2 times as long as wide, ciliate, glabrous to densely puberulent, or puberulent on tips only, glabrous or pubescent over upper half inside. *Corolla* white, cream, or with a pale orange tube and cream lobes, bud head 5.4–5.5 mm long, 0.39–0.41 of bud length, lanceolate, apex acute or acuminate; tube columnar, throat with or without thickening, 6.6–9.7 mm long, 1.3–2 mm wide, 2.5–7 times as long as sepals, 1.3–1.9 times as long as lobes, glabrous outside, inside sparsely pubescent around stamens and more densely in a band beneath them or pubescent around and below anthers and in throat with a glabrous gap between; lobes linear, elliptic or oblong, apex acute or acuminate, 4.1–5.6 by 1.2–2.3 mm, 2.4–4.3 times as long as wide, glabrous outside, glabrous or pubescent at base of lobes inside, not ciliate. *Stamens* inserted at 2.4–5.5



Map 11. Distribution of *Alyxia ilicifolia* F. Muell. (●) and *A. magnifolia* F.M. Bailey (◆).

mm from corolla base which is 0.31–0.54 of tube length; anther apex 1.5–4 mm from corolla mouth; anthers 1.2–1.7 by 0.4–0.6 mm, 2.4–3.2 times as long as wide; filament 0.5–0.7 mm long. *Ovary* 0.8–1.1 mm high, densely pubescent all over; style 0.7–3.8 mm long; pistil head 0.6–1 mm long. *Fruit* orange, stalk 1.2–2.4 mm long; with 1 or 2 articles, 1–2.3 mm between articles, sparsely puberulent at ends; articles with thin flesh, 7.2–12 by 4.8–6.6 mm, ellipsoid, symmetrical, apex obtuse or acute. *Seeds* ruminant, 7.3–9.6 by 4.5–4.9 by 3.8–3.9 mm.

Distribution — Australia (Queensland).

Habitat — Recorded from rain forest to 900 m altitude.

Notes — The leaf margin is noticeably thickened. Whether the margin has teeth or not is variable, even often within an individual. Forster (1992) noted that some whole populations have entire margins.

Some specimens from New South Wales have smallish leaves like *A. ruscifolia* but spiny margins like *A. ilicifolia*. I am not sure of the status of these plants as they are not flowering (*Wild s.n.* (Nov. 1986) NSW) and their status will need to be checked when better material is available. Mounted on a single sheet with two collections of *A. ruscifolia* are two collections of *A. ilicifolia*, *Fraser 512* and *513*, reported to be from New South Wales without any further precise locality. Both have toothed margins although *512* has particularly small leaves for this species. Either the collecting locality information is mistaken or this species has not subsequently been collected in New South Wales. Indeed *A. ilicifolia* has not been collected in Queensland anywhere near the border with New South Wales. The clearest examples are *Wild s.n.* from Mt Boss, NSW (29° 01' S, 152° 42' E), *Williams s.n.* (30.9.1985, NSW) from Mt Hyland (31° 10' S, 152° 27' E) and *Wilcost s.n.* (Nov. 1875, MEL) from Clarence River none of which are flowering.

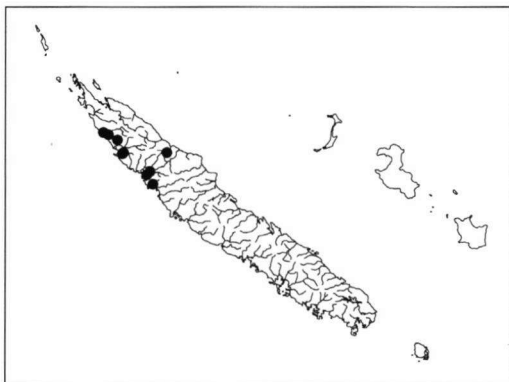
15. *Alyxia kaalaensis* Boiteau — Map 12

Alyxia kaalaensis Boiteau in Boiteau & L. Allorge (1979) 446; Boiteau (1981) 110. — Type: *H.S. McKee 13599* (holo P; iso P) from New Caledonia, Mt Kaala.
Alyxia cf. calettioides Guillaumin (1957) 76.

Erect shrubs, climbers, or shrubs with arching stems, 0.6–1.5 m high; bark brown. *Branchlets* weakly angled, sparsely lenticellate, sparsely to densely puberulent, minutely puberulent or glabrescent. *Leaves* opposite or in whorls of 3; petiole 0.1–0.3 cm long, pubescent; blade coriaceous or subcoriaceous, linear, elliptic, broadly elliptic, ovate, oblong or circular, apex retuse or truncate to acute, not mucronate, base subcordate to cuneate, margin weakly to strongly inrolled, not undulate, dark green and shining above, pale green beneath, 0.4–4 by 0.1–1.4 cm, 0.8–40 times as long as wide, midrib flattened or slightly sunken above, intramarginal nerve absent, secondary veins c. 13 pairs, indistinct above, obscure or weakly visible beneath, tertiary venation obscure; sparsely puberulent only on midrib or puberulent all over beneath and above. *Inflorescence* 1–4-flowered, terminal or pseudoterminal; flowers solitary in a simple unbranched pleiochasium, or of solitary flowers in the uppermost leaf axils together with a terminal simple pleiochasium, glabrous to densely puberulent, 0.7–1.5 cm long; peduncle 0–1 cm long, 0.6–0.9 mm wide, weakly flattened or more or less terete; bracts caducous or persistent, deltoid or leafy, 1.1–1.5 by 0.5–1 mm; bracteoles absent; pedicels 0.5–4 mm long. *Sepals* 4–6, ovate, apex acute, not reflexed, 1–1.9 by 0.8–1.4 mm, 1–1.8 times as long as wide, ciliate, glabrous to densely puberulent, pubescent only at tips inside. *Corolla* white or pink; bud head 1.8 mm long, 0.31 of bud length, ellipsoid, apex acute; tube columnar or slightly inflated, throat with thickening, 3–5.5 mm long, 0.9–1.2 mm wide, 2.5–3.6 times as long as sepals, 1.85–2.8 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic or ovate, apex obtuse to acuminate, 1.3–2.6 by 0.8–1.5 mm, 1.2–2.1 times as long as wide, glabrous outside, glabrous or pubescent at tips of lobes inside, ciliate near tips only. *Stamens* inserted at 2.2–2.7 mm from corolla base which is 0.6–0.67 of tube length; anther apex 0.3–0.7 mm from corolla mouth; anthers 0.8–1.1 by 0.3–0.4 mm, 2–3 times as long as wide; filament 0.2–0.3 mm long. *Ovary* 0.5–0.8 mm high, densely pubescent all over, pubescent around base only or pubescent only in a tuft between the carpels; style 1–2 mm long; pistil head 0.4–0.7 m long. *Fruit* with 1 or 2 ellipsoid articles.

Distribution — New Caledonia.

Habitat — In sclerophyllous scrub and maquis, reportedly on serpentine, altitude 20–500 m.



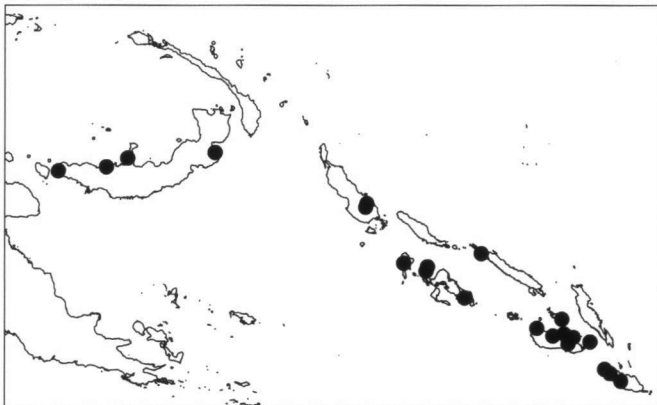
Map 12. Distribution of *Alyxia kaalaensis* Boiteau.

Note — *Alyxia kaalaensis* is more restricted than was suggested by Boiteau (1981) as there are only a few populations from nearby areas, each population quite recognisable with the Kaala plants having smaller corollas than the Siounda plants and the Tinip plants having wider corolla lobes and longer narrower leaves. The collections from Oua Tilou have particularly small leaves and delicate flowers. The sample size for each population, however, is rather restricted so the populations may be more variable within themselves than the currently known variation would suggest. There are 4- and 6-sepaled flowers on the type.

16. *Alyxia kwalotabaa* D.J. Middleton — Map 13

Alyxia kwalotabaa D.J. Middleton (2000) 61. — Type: *R. Schodde & L.A. Craven 3803* (holo CANB; iso A, K, L, LAE) from Papua New Guinea, Bougainville Island, Lake Loloru, c. 15 miles N of Buin.

Climber. *Branchlets* weakly angled, sparsely lenticellate, glabrous. *Leaves* in whorls of 3 or 4; petiole 0.8–1.3 cm long, glabrous; blade coriaceous or thickly coriaceous, mostly obovate, often also elliptic, apex short or long blunt acuminate, not mucronate, base acute to cuneate, margin flat or weakly undulate, 4.3–14 by 1.8–7.4 cm, 1.5–3.6 times as long as wide, midrib sunken above, intramarginal nerve distinct at margin, secondary veins 35–70 pairs, 70–80° from midrib, weakly prominent above, obscure to prominent beneath, tertiary venation weakly prominent above, reticulate or parallel to secondary veins; glabrous beneath and above, not punctate. *Inflorescence* 4-flowered, axillary, a simple unbranched pleiochasium, robust, glabrous to sparsely or densely puberulent all over, 1.7–2.4 cm long; peduncle 0.2–2.2 cm long, 1.3–2.8 mm wide; bracts persistent, deltoid, 1.4–2.6 by 1.4–2 mm; bracteoles absent; pedicels 1.2–1.8 mm long. *Sepals* not fleshy, ovate, apex obtuse to acute, 1.5–2.6 by 1–2 mm, 1.1–1.7 times as long as wide, ciliate, glabrous outside and inside. *Corolla* white or cream; bud head 3.6–3.8 mm long, 0.25–0.32 of bud length, ovate, apex acute; tube columnar, throat with thickening, 8.1–11.2 mm long, 1.6–2.2 mm wide, 4.3–5.4 times as long as sepals, 2.7 times as long as lobes, glabrous outside, pubescent in upper half and around stamens or in a band below the stamens inside; lobes ovate, apex obtuse to



Map 13. Distribution of *Alyxia kwalotabaa* D.J. Middleton.

acute, auriculate, 3 by 2.7 mm, 1.1 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 6.6–10 mm from corolla base which is 0.82–0.83 of tube length; anther apex 0.1–0.4 mm from corolla mouth, anthers 1.1–1.4 by 0.5 mm, 2.2–2.8 times as long as wide; filament 0.8 mm long. *Ovary* 0.9–1.1 mm high, densely pubescent all over; style 6–9 mm long; pistil head 0.4 mm long. *Fruit* black; stalk 1.5–5 mm long; with 1 article; glabrous or sparsely puberulent all over, fleshy or with thin flesh, 16.5–36 by 13–21 mm, ellipsoid, symmetrical, apex rounded to acuminate and hooked. *Seeds* elliptic, ruminant, 18.5–22 by 12.5–16 by 11.2–14.5 mm. Embryo cotyledons wider than radicle, strongly undulate, 19 mm long, 0.81 of embryo length.

Distribution — New Guinea (New Britain, Bougainville), Solomon Islands.

Habitat — In a wide range of primary and secondary forest types and scrub on well-drained and ridge top soils at 30–1524 m altitude.

Note — This species is probably more closely related to other plants in the Pacific Islands such as *A. efatensis* and *A. bracteolosa* than it is to *A. acuminata*, under various synonyms of which it was generally previously referred. The simplest way to tell it apart from both *A. efatensis* and *A. bracteolosa* is in the lack of bracteoles on the pedicels but it also generally has very clearly obovate leaves, a character not found in the other two species.

17. *Alyxia leucogyne* Van Heurck & Müll. Arg. — Map 14

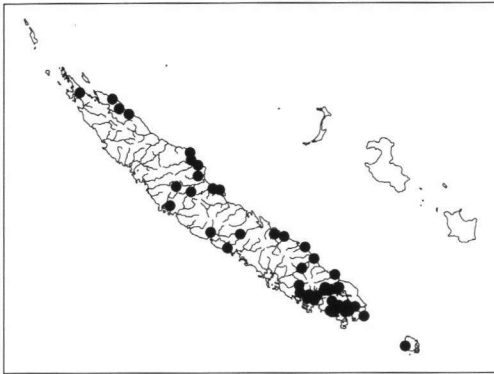
Alyxia leucogyne Van Heurck & Müll. Arg. (1870) 170; Däniker (1933) 382; Guillaumin (1948) 291; Boiteau (1981) 102. — *Pulassarium leucogyne* (Van Heurck & Müll. Arg.) Kuntze (1891) 417. — Type: *Deplanche 944* (holo AWH; iso BM, G, K, L) from New Caledonia, Grand Tupiti Island.

Alyxia grandis Pancher & Sebert (1873) 573, nom. nud. — Based on *J.A.I. Pancher 944* (P).

Gynopogon sapiifolius Baill. (1889a) 775. — *Alyxia sapiifolia* (Baill.) Schltr. (1906) 238. — Type: *B. Balansa 3474* (lecto P, designated here; iso A, K, L, P) from New Caledonia, Mouth of the Dothio River.

Alyxia leucogyne var. *stenophylla* Guillaumin (1957) 79. — Type: *A. Guillaumin & M. G. Baumann-Bodenheim 10069* (lecto P, designated here; isolecto Z). Syntype: *A. Guillaumin & M. G. Baumann-Bodenheim 11653* (P, Z).

Climbers, often very large and robust; bark brown, rough. *Branchlets* strongly angled, not lenticellate, glabrous or sparsely puberulent or glabrescent. *Leaves* in whorls of 4 or 5; petiole 1–2 cm long, glabrous; blade coriaceous, elliptic, obovate or spatulate, apex retuse to obtuse, not mucronate, base decurrent onto petiole, margin weakly to strongly inrolled, weakly undulate, 3.2–16.4 by 1.9–6.2 cm, 1.5–3.1 times as long as wide, midrib slightly sunken or raised and with a central groove above, intramarginal nerve absent, secondary veins 27–63 pairs, 70° from midrib, weakly prominent above, obscure to weakly prominent beneath, tertiary venation weakly prominent or obscure; glabrous beneath and above, not punctate beneath. *Inflorescence* 25–65-flowered, axillary, a compound pleiochasium with distinct internodes or an aggregate pleiochasium forming lax panicles, densely puberulent, 3–8.5 cm long; peduncle 0.7–3.6 cm long, 1.3–2.2 mm wide; bracts caducous or persistent, deltoid, 0.5–0.8 mm long, 0.8–1 mm wide; bracteoles two on pedicel, usually one on pedicel and one at base; pedicels 0.7–2.2 mm long. *Sepals* ovate, apex acuminate, not reflexed, 0.7–1.1 by 0.7–0.9 mm, 1–1.6 times as long as wide, ciliate, sparsely puberulent, pubescent only



Map 14. Distribution of *Alyxia leucogyne* Heurck & Müll. Arg.

at tips inside. *Corolla* white, fragrant; bud head 1.3–1.5 mm long, 0.34–0.4 of bud length, ellipsoid, apex rounded or obtuse, much narrower than the tube in younger buds; tube slightly inflated, 2.8–3.6 mm long, 1.1–1.5 mm wide, 2.8–4.4 times as long as sepals, 2–2.8 times as long as lobes, glabrous to sparsely puberulent around top of tube outside, pubescent in a band below the stamens or sparsely pubescent around stamens and more densely in a band beneath them inside; lobes orbicular, apex rounded, 1.3–1.6 by 1–1.3 mm, 1.2–1.3 times as long as wide, glabrous outside and inside, ciliate near tips only. *Stamens* inserted at 1.9–2.3 mm from corolla base which is 0.59–0.7 of tube length; anther apex 0–0.3 mm from corolla mouth; anthers 0.8–0.9 mm long, 0.35–0.4 mm wide, 2.25–2.3 times as long as wide; filament 0.5 mm long. *Ovary* 0.8–1.1 mm high, densely pubescent all over; style 1.1–1.3 mm long; pistil head 0.2–0.4 mm long. *Fruit* orange-brown, stalk 4–8 mm long, with 1–4 articles, 2.6–5.5 mm between articles, glabrous to densely puberulent, endocarp very tough; articles 7.4–16.1 by 6.5–8.5 mm, ellipsoid, globose or subglobose, symmetrical or asymmetrical, apex rounded to obtuse. *Seeds* elliptic, ruminant or longitudinally ridged, 10.4–11.2 by 6.2–6.5 by 4.4–5.7 mm. Embryo linear, straight at base, 7.3 mm long, cotyledons 0.63 of embryo length.

Distribution — New Caledonia.

Habitat — In wet primary or secondary forest or scrub or in littoral forest, maquis or swampy thicket. Recorded from serpentine, schist and basalt soils at 0–900 m altitude.

18. *Alyxia loesneriana* Schltr. — Map 15

Alyxia loesneriana Schltr. (1906) 237; Guillaumin (1948) 292; Boiteau (1981) 142. — Type: *F.R.R.*

Schlechter 15689 (B (destroyed); lecto P, designated here) from New Caledonia, Oua Hinna.

Alyxia johnsoniae S. Moore (1921) 358; Guillaumin (1948) 292. — Type: *R.H. Compton 543* (holo BM) from New Caledonia, Mt Mou.

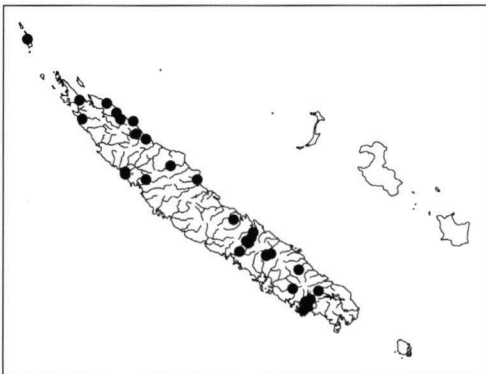
Alyxia spec. nov. S. Moore (1921) 360. — Type: Based on *R.H. Compton 1035* (BM, K).

Alyxia loesneriana var. *macrocarpa* Boiteau in Boiteau & L. Allorge (1979) 450; Boiteau (1981) 144. — Type: *H.S. McKee 6414* (holo P) from New Caledonia, Mt Panié.

Alyxia vieillardii Boiteau in Boiteau & L. Allorge (1979) 452; Boiteau (1981) 150. — Type: *E. Vieillard 961* (holo P; iso L, P) from New Caledonia, Balade.

Erect shrubs or climbers. *Branchlets* weakly or strongly angled, not to densely lenticellate, glabrous. *Leaves* opposite or in whorls of 4; petiole 0.3–1.1 cm long, glabrous, blade coriaceous to papery, elliptic or obovate, apex retuse to acuminate, sometimes apiculate, not mucronate, base acute or cuneate, margin flat or weakly to strongly inrolled, weakly to strongly undulate, 2.4–10.4 by 1–3.8 cm, 1.4–3.6 times as long as wide, midrib flattened or sunken above, intramarginal vein absent or present and inset from or at margin, secondary veins 11–24 pairs, 45–70° from midrib, prominent or only weakly visible above, weakly to clearly visible beneath, tertiary venation weakly prominent to obscure; glabrous beneath and above, not punctate beneath. *Inflorescence* 3–7-flowered, axillary, a simple unbranched pleiochasium, a short congested compound pleiochasium, or with 1 or 2 internodes and unbranched side branches, delicate, glabrous, 0.8–1.5 cm long; peduncle 0–0.5 cm long, 0.7–1.2 mm wide, weakly flattened; bracts caducous or persistent, ovate or deltoid, 0.8–0.9 mm long, 0.8 mm wide; bracteoles present, one immediately beneath calyx, sometimes with a second on the pedicel; pedicels 0.7–2 mm long. *Sepals* ovate, apex acute, not reflexed, 1–1.4 by 0.7–1.5 mm, 0.9–1.7 times as long as wide, ciliate, glabrous outside, of similar sizes, pubescent only at tips or glabrous inside. *Corolla* white, with an orange tube and yellow lobes, or with a pale orange tube and cream lobes; bud head 2–2.4 mm long, 0.31–0.39 of bud length, ellipsoid, apex acute; tube columnar or slightly inflated, 3.4–5.6 mm long, 1.1–1.4 mm wide, 3.2–4.6 times as long as sepals, 1.6–3.2 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, ovate or orbicular, apex rounded or obtuse, 1.6–2.7 by 1.1–1.8 mm, 0.9–1.9 times as long as wide, glabrous outside, glabrous or pubescent at base of lobes inside, not ciliate. *Stamens* inserted at 2.4–3.9 mm from corolla base which is 0.47–0.73 of tube length; anther apex 0–0.9 mm from corolla mouth; anthers 0.9–1.1 mm long, 0.3–0.4 mm wide, 2.25–3 times as long as wide; filament 0.3–0.5 mm long. *Ovary* 0.8–1.1 mm high, densely pubescent all over; style 2–2.6 mm long; pistil head 0.4–0.6 mm long. *Fruit* stalk 3–10 mm long, with 1–6 articles, 2.5–5 mm between articles, glabrous, sparsely puberulent at ends or all over; articles with thin flesh, 15.5–38 by 6.5–12 mm, ellipsoid or fusiform, symmetrical or asymmetrical, apex acute or acuminate. *Seeds* ruminant or longitudinally ridged, 10–23 by 4.8–7.5 by 3.8–8 mm.

Distribution — New Caledonia.



Map 15. Distribution of *Alyxia loesneriana* Schltr.

Habitat — In wet forest or in scrub at 60–1000 m altitude. Recorded from serpentine, basalt, ferrous and schist soils.

Note — Boiteau in Boiteau & Allorge (1979) described *A. vieillardii* based on its opposite membranous leaves, short peduncle and small flowers. However, all the leaf characters are frequently found in *A. loesneriana* and the inflorescences of the type material are immature and the flowers only in bud. Indeed the type material of *A. loesneriana* itself has both opposite leaves and leaves in whorls of three and the peduncle is also extremely short.

19. *Alyxia magnifolia* F.M. Bailey — Map 11

Alyxia magnifolia F.M. Bailey (1910) 10; Stanley & E.M. Ross (1986) 305. — *Alyxia ilicifolia* subsp. *magnifolia* (F.M. Bailey) P.I. Forst. (1992) 569; (1996) 131. — Type: *J. Keys* 80 (lecto BRI, designated by Forster (1992); iso K (but without number)) from Australia, Queensland, Wide Bay District, Lake Cootharaba.

Erect shrubs or treelets, 5 m high. *Branchlets* weakly angled, sparsely lenticellate or not, glabrous or sparsely to densely and minutely puberulent. *Leaves* in whorls of 3 or 4; petiole 0.2–0.8 cm long, glabrous or pubescent; blade coriaceous, narrowly to broadly elliptic, or ovate, apex acuminate, mucronate, base obtuse to decurrent onto petiole, margin weakly inrolled or flat, not to strongly undulate, 1–14.7 by 0.7–5.5 cm, 1.6–3.4 times as long as wide, midrib sunken above, intramarginal nerve distinct at margin or absent, secondary veins 17–45 pairs, 20–60° from midrib, distinct and prominent or only weakly distinguishable above, obscure to weakly prominent beneath; tertiary venation weakly prominent or flattened above, parallel to secondary veins, obscure, or branching off from secondary veins; glabrous to sparsely puberulent all over beneath, above glabrous to puberulent all over, or with a few hairs along the margin, not punctate beneath. *Inflorescence* 4–8-flowered, axillary, terminal or pseudo-terminal, a short congested compound pleiochasium or with 1 or 2 internodes and unbranched side branches, robust, glabrous or sparsely puberulent all over, 1.5–3 cm long; peduncle 0.2–0.8 cm long, 1.9 mm wide, weakly flattened; bracts persistent, lanceolate, 3.5–3.7 by 1–1.6 mm; pedicels 0.5–3 mm long. *Sepals* ovate or lanceolate, apex acute to acuminate, 1.8–3.7 by 1.2–1.4 mm, 2–2.6 times as long as wide, ciliate, glabrous or sparsely puberulent outside, pubescent only at tips or glabrous inside. *Corolla* with a pale orange tube and cream lobes; bud head c. 6 mm long, 0.45 of bud length, lanceolate, apex acute to acuminate; tube 7.1–8 mm long, 1.2–1.4 mm wide, 1.9–4.2 times as long as sepals, 1.2–2 times as long as lobes, glabrous outside, inside sparsely pubescent around stamens and more densely in a band beneath them or pubescent around and below anthers and in throat with a glabrous gap between; lobes elliptic or ovate, apex acute to acuminate, 3.5–6.5 by 1.7–1.9 mm, 2.1–3.4 times as long as wide, glabrous outside, glabrous or pubescent at base of lobes inside, not ciliate. *Stamens* inserted at 4.5–5.4 mm from corolla base which is 0.66–0.72 of tube length; anther apex 0.3–1.8 mm from corolla mouth; anthers 1.1–1.5 by 0.4 mm, 2.75–3.75 times as long as wide; filament 0.4–0.8 mm long. *Ovary* 1 mm high, densely pubescent all over; style 3–3.9 mm long; pistil head 0.7 mm long. *Fruit* generally with 2 articles, 0–0.1 mm between articles; articles with thin flesh, 10.5–16.5 by 7.5–9 mm, ellipsoid, symmetrical, apex rounded to acute. *Seeds* ruminant, c. 8.3 by 5.8 by 4.6 mm.

Distribution — Australia (Queensland).

Habitat — In evergreen wet forest or scrub at c. 100 m altitude. Reported from serpentine soil.

Notes — Forster (1992) included this taxon as a subspecies of *A. ilicifolia*. I have decided to reinstate it as a full species to maintain a level of consistency with other species in the genus although the two species are close. Forster suggested that the only character to consistently separate the two taxa was in the sepal shape and size but there is also a difference in the position of the stamens with those of *A. magnifolia* inserted higher up in the corolla tube.

One specimen, *Moon s.n.* (MEL), has a label which says New South Wales and three pieces of *Alyxia* on it. One piece is *A. ruscifolia* and the other two pieces are *A. magnifolia*. It is unclear whether the label applies to all three pieces or not but if it is correct these are the only specimens known from New South Wales although without a more precise locality.

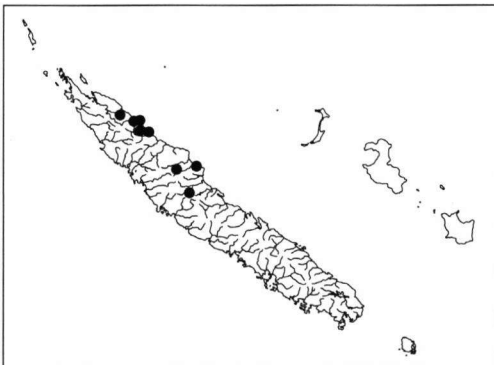
20. *Alyxia margaretae* Boiteau — Fig. 2, Map 16

Alyxia margaretae Boiteau in Boiteau & L. Allorge (1979) 456; Boiteau (1981) 158. — Type: *H.S. McKee* 26692 (holo P; iso P) from New Caledonia, Poindimié, Povila.

Alyxia integricarpa Boiteau in Boiteau & L. Allorge (1979) 453; Boiteau (1981) 155. — Type: *H.S. McKee* 13875 (holo P) from New Caledonia, Mt Panié.

Alyxia margaretae var. *acutifolia* Boiteau in Boiteau & L. Allorge (1979) 456; Boiteau (1981) 160. — Type: *H.S. McKee* 23761 (holo P; iso L) from New Caledonia, Pouébo, Ouangati.

Climbers, erect shrubs or shrubs with arching stems, 1–2.5 m high. *Branchlets* terete or weakly angled, sparsely or densely lenticellate, glabrous. *Leaves* opposite; petiole 0.4–1.3 cm long, glabrous; blade coriaceous or thickly coriaceous, elliptic, ovate or oblong, apex rounded to acuminate, mucronate, base rounded to cuneate, margin weakly inrolled or flat, weakly undulate or not, 3.3–10.3 by 0.8–4.8 cm, 1.2–13.4 times as long as wide, midrib sunken above, intramarginal nerve strong or weak and inset from margin, secondary veins 16–35 pairs, 60–70° from midrib, weakly prominent or indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent or obscure above; glabrous beneath and above, not punctate beneath. *Inflorescence* 1–3-flowered, axillary or terminal, a compound pleiochasium with distinct internodes,



Map 16. Distribution of *Alyxia margaretae* Boiteau.

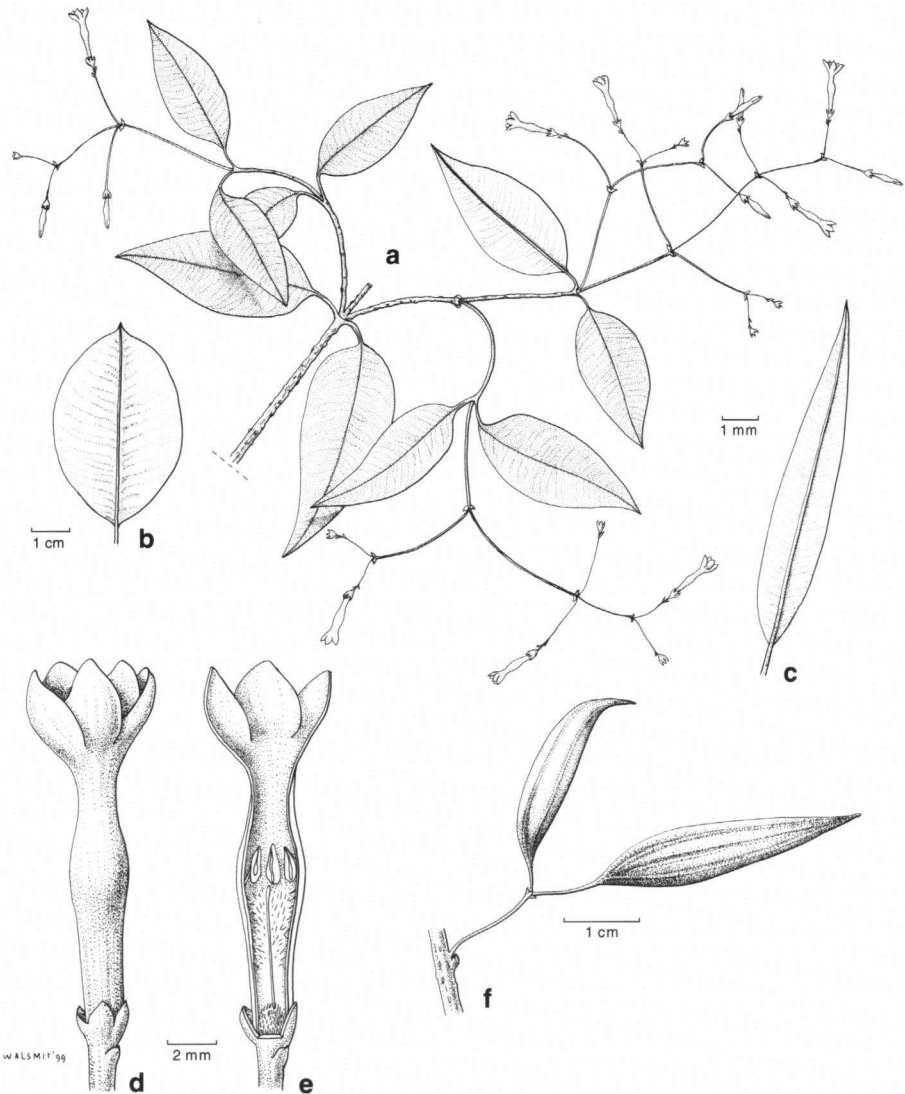


Fig. 2. *Alyxia margaretae* Boiteau. a. Habit; b & c. leaves showing variation in shape; d. flower; e. flower dissection; f. fruit (a, d & e: *McKee 31211*; b: *Veillon 2303*; c: *McKee 15629*; f: *Schmid 4508*).

large lax panicles frequently branched, or of first order dichasial branching and second order alternate branches, delicate, glabrous, 4.8–14 cm long; peduncle 2.2–5.2 cm long, 0.6–1 mm wide, strongly flattened or weakly flattened; bracts persistent, deltoid, 0.5–1 by 0.6–1 mm; bracteoles present, one on pedicel, two immediately beneath calyx or two on pedicel; pedicels 2.8–22 mm long. *Sepals* ovate, apex obtuse, not reflexed, 0.9–1.8 by 0.7–1.4 mm, 0.75–2.6 times as long as wide, ciliate or not, glabrous outside and inside. *Corolla* white, yellow, or with a pink tube and white lobes; bud

head 2.8–4.2 mm long, 0.31–0.34 of bud length, ellipsoid, ovate or deltoid, apex acute or acuminate; tube columnar, 8.7–10.5 mm long, 1.9–2.2 mm wide, 4.8–10.8 times as long as sepals, 2.4–2.8 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate, apex obtuse, 3.7–3.8 by 2–2.5 mm, 1.5–1.9 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 6–6.1 mm from corolla base which is 0.61–0.63 of tube length; anther apex 2–2.1 mm from corolla mouth; anthers 1.5–1.9 by 0.5–0.6 mm, 2.5–3.8 times as long as wide; filament 0.4–0.5 mm long. *Ovary* 0.9 mm high, densely pubescent all over or pubescent only on top; style 5.2 mm long; pistil head 0.7 mm long. *Fruit* red or black, stalk 4–9 mm long, with 1 or 2 articles, 6 mm between articles, glabrous; articles with thin flesh, 24–57 by 3.8–8 mm, cylindrical or fusiform, symmetrical or asymmetrical, apex acuminate. *Seeds* oblong, longitudinally ridged, 31–39 by 3.3–5.2 by 3.1–4.9 mm.

Distribution — New Caledonia.

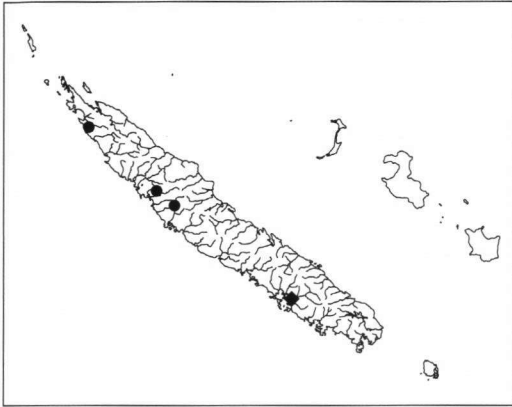
Habitat — Gallery or wet forest, at 50–700 m altitude.

Note — The pedicel in fruit elongates and the bracteoles are lower down the pedicel than in the flower. The inflorescence axes are particularly long and delicate in flower and fruit with two orders of branching.

21. *Alyxia mucronata* D.J. Middleton, *nom. nov.* — Map 17

Alyxia cylindrocarpa subsp. *coriacea* Boiteau in Boiteau & L. Allorge (1979) 456; Boiteau (1981) 157. — Type: *A. U. Däniker 1043* (holo *Z*) from New Caledonia, Mt Koniambo.

Erect shrubs. *Branchlets* weakly angled, sparsely lenticellate, sparsely puberulent to tomentose or glabrescent. *Leaves* opposite; petiole 0.1–0.3 cm long, pubescent; blade coriaceous, elliptic or ovate, apex retuse to acuminate but always with a minute or larger mucronate tip, base rounded to obtuse, margin weakly inrolled, weakly undulate or not, 1–3.5 by 0.6–1.9 cm, 0.9–2.5 times as long as wide, midrib flattened or slightly sunken above, intramarginal nerve absent or weakly present and inset from margin, secondary veins 11 pairs, weakly distinguishable or indistinct above, obscure beneath, tertiary venation obscure; glabrous to tomentose beneath, generally less hairy with age, puberulent all over above when young, generally becoming glabrous with age, not punctate beneath. *Inflorescence* 3-flowered, axillary or terminal, a simple unbranched pleiochasium, delicate, sparsely to densely puberulent, 1.2–1.5 cm long; peduncle 0.15–0.18 cm long, 0.5–0.8 mm wide, weakly flattened or more or less terete; bracts persistent, c. 1.2 by 0.9 mm wide; bracteoles present, two immediately beneath calyx; pedicels 1.3–3 mm long. *Sepals* ovate, apex acute, not reflexed, 0.9–1.1 by 1 mm, 0.9–1.1 times as long as wide, ciliate, glabrous or densely puberulent outside, glabrous inside. *Corolla* bud head 2.6 mm long, 0.25 of bud length, ellipsoid, apex acute; tube columnar, 7.2–9.4 mm long, 1.6 mm wide, 6.5–9.6 times as long as sepals, 2.8–3.6 times as long as lobes, sparsely puberulent around top of tube outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, apex obtuse or acute, 2.4–3.4 by 1.6–1.9 mm, 1.3–1.8 times as long as wide, glabrous or sparsely puberulent outside, glabrous inside, not ciliate. *Stamens* inserted at 5.8–7.5 mm from corolla base which is 0.74–0.81 of tube length; anther apex 0.2–1 mm from corolla mouth; anthers 1.1–1.2 by 0.5–0.6 mm, 1.8–2.4 times



Map 17. Distribution of *Alyxia mucronata* D.J. Middleton (●) and *A. veillonii* D.J. Middleton (◆).

as long as wide; filament 0.4 mm long. *Ovary* 0.7–1.2 mm high, densely pubescent all over; style 4.5–6.4 mm long; pistil head 0.7–0.8 mm long. *Fruit* red or green, stalk 2.3 mm long, with 1 or 2 articles, glabrous; articles with thin flesh, 17–22 by 4.5–5 mm, cylindrical or fusiform, symmetrical, apex acute. *Seed* longitudinally ridged, 10.7 by 3.6 by 3 mm.

Distribution — New Caledonia.

Note — This species was originally described as subsp. *coriacea* of *A. cylindrocarpa*. This subspecies, however, has been raised to specific rank, with a new name due to the earlier name *A. coriacea* Wall., because it differs from *A. cylindrocarpa* in the pubescence of the branchlets and leaves, the pubescence on the outside of the corolla tube, the corolla lobe shape and the coriaceous leaves.

22. *Alyxia oblongata* Domin — Map 18

Alyxia oblongata Domin (1928) 523; D.J. Middleton (2000) 83. — Type: *K. Domin Iter Australiense* 7831 (holo PR) from Australia, Queensland, Cook District, Waterfall Creek.

Alyxia ruscifolia subsp. *major* P.I. Forst. (1992) 557; (1996) 128. — Type: *P.I. Forster & M. C. Tucker PIF5574* (holo BRI; iso BISH, DNA, LAE, MO) from Australia, Queensland, Cook District, Big Tableland road, near First Falls.

Alyxia ruscifolia auct. non R.Br.: Markgr. (1977) 412.

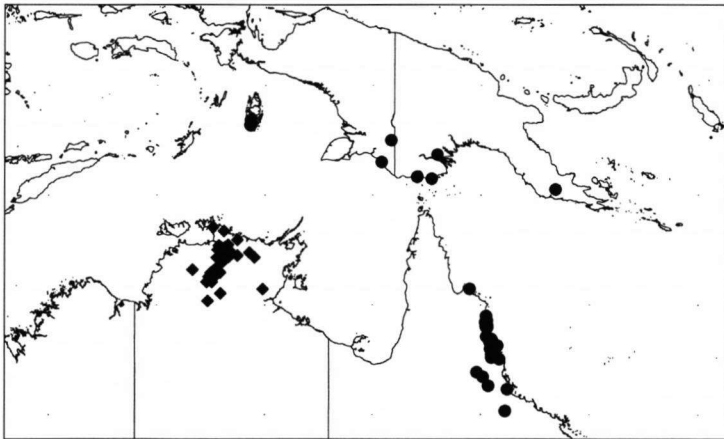
Erect shrubs or treelets, to 2 m high. *Branchlets* weakly angled, not lenticellate to densely so, glabrous to densely puberulent. *Leaves* in whorls of 3 or 4; petiole 0.1–0.4 cm long, glabrous; blade coriaceous, narrowly elliptic, elliptic, ovate or obovate, apex long and sharply acuminate, mucronate, base acute to cuneate, margin flat or weakly to strongly inrolled, not undulate or weakly so, leaf blade 0.4–7.8 by 0.15–2.8 cm, 1.5–5.7 times as long as wide, midrib flattened or sunken above, intramarginal nerve absent, secondary veins 9–29 pairs, 35–40° from midrib, strongly to weakly prominent above, weakly visible beneath, tertiary venation strongly to weakly prominent above, parallel to secondary veins or branching off from secondary veins; glabrous beneath and above, not punctate beneath. *Inflorescence* 1–5-flowered, of axillary or terminal solitary flowers, a simple unbranched pleiochasium or a short congested compound

pleiochasium, delicate, glabrous, 1.2–1.6 cm long; peduncle 0.1–0.5 cm long, 1.2 mm wide, more or less terete; bracts caducous or persistent, lanceolate, 1–1.8 by 0.6–0.8 mm; bracteoles present, one on pedicel; pedicels 0.1–0.5 mm long. *Sepals* ovate or lanceolate, apex acute or acuminate, not reflexed, 1.8–2.6 by 0.9–1.5 mm, 1.4–2.6 times as long as wide, ciliate, glabrous outside and inside. *Corolla* white or cream, fragrant; bud head 4.7–6.8 mm long, 0.37–0.44 of bud length, lanceolate, apex acuminate; tube columnar, 5.8–9.5 mm long, 1–1.5 mm wide, 3.1–4.8 times as long as sepals, 1.5–2.2 times as long as lobes, glabrous outside, inside sparsely pubescent around stamens and more densely in a band beneath them, or pubescent around and below anthers and in throat with a glabrous gap between; lobes linear, elliptic or oblong, apex obtuse to acuminate, 3.5–5.9 by 1–2 mm, 2.3–4.8 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 2.4–5.9 mm from corolla base which is 0.37–0.58 of tube length; anther apex 2.2–4.2 mm from corolla mouth; anthers 0.8–1.3 by 0.3–0.4 mm, 2.5–3.4 times as long as wide; filament 0.3–0.5 mm long. *Ovary* 0.5–0.7 mm high, sparsely to densely pubescent all over; style 1.5–2.7 mm long; pistil head 0.4–0.6 mm long. *Fruit* red, stalk 1.5 mm long, with 1 or 2 articles; articles with thin flesh, 6–9.6 by 4.5–7.5 mm, ellipsoid or subglobose, symmetrical, apex rounded or obtuse. *Seeds* ruminant, 5.3 by 3.9 by 3 mm.

Distribution — Australia, New Guinea, Timor.

Habitat — In swamp forest, dry forest, rain forest or wet *Eucalyptus* forest, often on clay, at 10–1370 m altitude.

Note — Forster (1992) resurrected this taxon in his revision of the Australian species but included it as a subspecies of *A. ruscifolia* with the name *A. ruscifolia* subsp. *major* P.I. Forst. I have already raised it back to specific status in the first part of this revision of *Alyxia* (Middleton, 2000) and a discussion of other issues relating to the *A. ruscifolia* group can be found under that species.

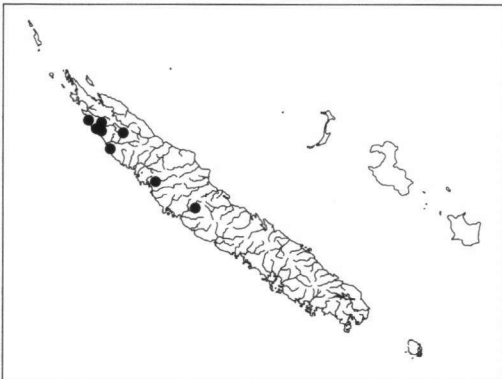


Map 18. Distribution of *Alyxia oblongata* Domin (●) and *A. tropica* (P.I. Forst.) D.J. Middleton (◆).

23. *Alyxia oppositifolia* Boiteau — Map 19

Alyxia oppositifolia Boiteau in Boiteau & L. Allorge (1979) 452; Boiteau (1981) 151. — Type: *H.S. McKee 16599* (holo P; iso L, P) from New Caledonia, Koumac Valley.

Erect shrubs, 1–2 m high. *Branchlets* weakly angled, not lenticellate or sparsely so, glabrous or sparsely to densely puberulent. *Leaves* opposite or in whorls of 3; petiole 0.1–0.2 cm long, glabrous or pubescent; blade subcoriaceous or papery, linear, narrowly elliptic, elliptic or ovate, apex acute to acuminate, sometimes notched at the apex, not mucronate, base rounded to acute, margin flat, not undulate to strongly undulate, 0.8–3.9 by 0.2–1.2 cm, 1.3–10 times as long as wide, midrib slightly sunken above, intramarginal nerve absent, secondary veins 13–16 pairs, 60° from midrib, weakly prominent or indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent or obscure above; glabrous beneath, glabrous or puberulent only on midrib above, not punctate beneath. *Inflorescence* axillary, flowers solitary or a simple 3-flowered unbranched pleiochasium, delicate, glabrous or sparsely to densely pilose all over, 1.5–2.8 cm long; peduncle 0.4–2 cm long, 0.3 mm wide, weakly flattened; bracts persistent, deltoid or leafy, 0.9–2.5 by 0.8 mm; bracteoles absent when the inflorescence is 3-flowered or with two immediately beneath calyx or two on pedicel with solitary flowers; pedicels 1.5–10 mm long (longer ones are under solitary flowers and includes the length of what would be the peduncle). *Sepals* 4 or 5, ovate, apex obtuse or acute, not reflexed, 0.7–1.1 by 0.7–1.1 mm, 1 times as long as wide, ciliate, glabrous or sparsely pilose outside, pubescent only at tips inside. *Corolla* yellow, with a pink tube and white lobes, or with a pale orange tube and cream lobes; tube columnar, 5.2–8 by 1.1–1.5 mm, 4.7–11.4 times as long as sepals, 3.7–5 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate, apex rounded or obtuse, 1.4–1.6 by 1.3 mm, 1.1–1.2 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4.3–6.4 mm from corolla base which is 0.77–0.79 of tube length; anther apex 0.3–0.5 mm from corolla mouth; anthers 0.7–0.8 by 0.4 mm, 1.75–2 times as long as wide; filament 0.3 mm long. *Ovary* 0.6 mm high, glabrous or pubescent in a tuft between the carpels; style 3.6–4.7 mm long; pistil head 0.4–0.7 mm long. *Fruit* stalk 1.7–2.1 mm long, with 1 or 2 articles, glabrous; articles dry, with thin flesh, 7.8–16



Map 19. Distribution of *Alyxia oppositifolia* Boiteau.

by 5–7 mm, ellipsoid, symmetrical or asymmetrical, apex rounded to acute. *Seeds* ruminant or longitudinally ridged, 10.4 by 5.1 by 4.7 mm.

Distribution — New Caledonia.

Habitat — In forest, scrub or maquis on calcareous or serpentine soils at 30–250 m.

Note — This species would appear not to be as closely related to the other New Caledonian species which Boiteau & Allorge (1979) placed in series *Cylindrocarpae* as it lacks the rather elongated fruits of those species and does not have densely pubescent ovaries but rather small tufts between the carpels or glabrous. Boiteau (1981) describes this species as having triflorous inflorescences but even the holotype has mostly solitary flowers. This has probably come about by reduction from a simple pleiochasium as suggested by the presence of bracteoles on the pedicels of the solitary flowers but not on those of flowers in an inflorescence. These bracteoles would correspond to the subtending bracts of flowers in an inflorescence. Most other specimens have only solitary flowers. The calyx on *McKee 23714* is only 4-merous although the flowers are still 5-merous.

24. *Alyxia orophila* Domin — Map 7

Alyxia orophila Domin (1928) 523; P.I. Forst. (1992) 558; (1996) 129 — Type: *K. Domin Iter Australiense 7832* (lecto PR, designated by Forster (1992)) from Australia, Queensland, Cook District, Mt Bellenden Ker. Syntypes: *K. Domin Iter Australiense 7833* (PR), *K. Domin Iter Australiense 7834* (PR).

Erect shrubs, 1–2 m high. *Branchlets* weakly or strongly angled, not lenticellate or sparsely so, glabrous or sparsely and minutely puberulent. *Leaves* in whorls of 4; petiole 0.3–0.5 cm long, glabrous; blade coriaceous, elliptic, broadly elliptic or obovate, apex acuminate or obtuse and apiculate, mucronate, base acute to cuneate, margin weakly to strongly inrolled, weakly undulate, 0.6–5.3 by 0.4–3 cm, 1.2–3 times as long as wide, midrib sunken above, intramarginal nerve absent, secondary veins 15–21 pairs, 70° from midrib, weakly prominent above, obscure or weakly visible beneath, tertiary venation weakly visible or obscure above; glabrous beneath and above, not punctate beneath. *Inflorescence* axillary, flowers solitary, robust, glabrous, 1.5–1.7 cm long; bracts persistent, deltoid, 1.1–1.3 by 0.9–1.2 mm; pedicels 3–4 mm long. *Sepals* ovate, apex acute, not reflexed, 2.3–2.7 by 1.4–1.8 mm, 1.4–1.9 times as long as wide, ciliate, glabrous outside and inside. *Corolla* white, cream, white with an orange tube, or with a buff coloured tube and white lobes, fragrant; bud head 6.4 mm long, 0.48 of bud length, lanceolate, apex acuminate; tube columnar, throat with thickening, 5.8–7.2 mm long, 1.8–2.3 mm wide, 2.1–2.8 times as long as sepals, 1.3–1.4 times as long as lobes, glabrous outside, inside pubescent around and below anthers and in throat with a glabrous gap between; lobes ovate, obtuse, apiculate, 4.2–5.1 by 2.2–3.3 mm, 1.5–2 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4.3–5.2 mm from corolla base which is 0.61–0.65 of tube length; anther apex 1 mm from corolla mouth; anthers 1.5–1.7 by 0.6 mm, 2.5–2.8 times as long as wide; filament 0.4–0.6 mm long. *Ovary* 0.9–1.2 mm high, densely pubescent all over; style 3.1–3.7 mm long; pistil head 0.5–0.7 mm long. *Fruit* black or orange, stalk 1–2.1 mm long, with 1 or 2 articles, 1 mm between articles, sparsely puberulent at ends; articles with thin flesh, 6.5–11.5 by 5.3–7.3 mm, ellipsoid or subglobose, symmetrical, apex rounded to acute. *Seed* ruminant, 5.9–8.7 by 3.4–4.6 by 3.1–4.1 mm.

Distribution — Australia (Queensland).

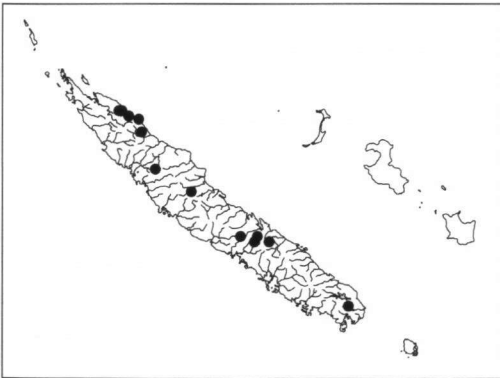
Habitat — In wet, montane and mossy forest or on rocky outcrops or in thickets at higher altitudes, 960–1650 m. Mostly on granitic soils.

25. *Alyxia oubatchensis* (Schltr.) Guillaumin — Map 20

Alyxia oubatchensis (Schltr.) Guillaumin (1911) 194; Boiteau in Boiteau & L. Allorge (1979) 450; Boiteau (1981) 149. — *Alyxia obovata* var. *oubatchensis* Schltr. (1906) 238. — *Gynopogon oubatchensis* (Schltr.) Boiteau (1981) 149, nom. inval. — Type: *F.R.R. Schlechter 15582* (B (destroyed); lecto P, designated here; iso BM, BR, E, G, HBG, K, W, WRS�) from New Caledonia, Oubatche.

Alyxia obovata Schltr. (1906) 238, nom. illeg.; Guillaumin (1948) 292. — Based on *F.R.R. Schlechter 15636* (BM, BR, G, HBG, K, P, WRS�) from New Caledonia, Oua Hinna.

Climbers. *Branchlets* weakly angled, sparsely lenticellate, glabrous to densely puberulent. *Leaves* in whorls of 3; petiole 0.4–1 cm long, glabrous or pubescent; blade coriaceous to papery, elliptic, obovate or spatulate, apex retuse to acuminate, not mucronate, base acute to cuneate, margin flat or weakly to strongly inrolled, not undulate to strongly so, 1.7–10 by 1–4.5 cm, 1.4–2.7 times as long as wide, midrib sunken above, intramarginal nerve strong or weak and inset from margin, secondary veins 13–21 pairs, 70–75° from midrib, strongly to weakly distinguishable and somewhat prominent to sunken above, often strongly prominent beneath, tertiary venation weakly prominent above; mostly sparsely pubescent beneath, more rarely glabrous, above glabrous to puberulent all over, not punctate beneath. *Inflorescence* 3–7-flowered, axillary, a simple unbranched pleiochasium, a compound pleiochasium with distinct internodes, or with 1 or 2 internodes and unbranched side branches, robust, sparsely to densely puberulent all over, 1.5–1.7 cm long; peduncle 0.2–0.5 cm long, 1.2–1.5 mm wide, weakly flattened; bracts caducous or persistent, ovate, 1.4–2.5 by 1.4–1.8 mm; bracteoles absent; pedicels 1.6–4.5 mm long. *Sepals* ovate, apex acute, not reflexed, 1.6–2.2 by 0.9–1.2 mm, 1.5–2.2 times as long as wide, ciliate, densely puberulent outside, pubescent only at tips or pubescent over upper half inside. *Corolla* cream or with an orange tube and yellow lobes, bud head 2.5–3 mm long, 0.27–0.32 of bud length, ellipsoid, apex obtuse to acute; tube columnar, 6.5–7.2 by 1.9–2.2 mm, 4–4.1 times as long as sepals, 2.1–2.8 times as long as lobes, glabrous or sparsely



Map 20. Distribution of *Alyxia oubatchensis* (Schltr.) Guillaumin.

puberulent all over outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate or orbicular, apex rounded to obtuse, 2.3–3.5 by 2.3–3.1 mm, 0.7–1.5 times as long as wide, glabrous outside, glabrous or sparsely pubescent at the tips and base of lobes inside, not ciliate. *Stamens* inserted at 5–5.1 mm from corolla base which is 0.65–0.69 of tube length; anther apex 0.7–1 mm from corolla mouth; anthers 1.4–1.5 mm long, 0.45–0.5 mm wide, 3–3.1 times as long as wide; filament 0.5–0.6 mm long. *Ovary* 0.8–1.2 mm high, densely pubescent all over; style 3.9–4 mm long; pistil head 0.5–0.7 mm long. *Fruit* orange-brown, stalk 3.2–9 mm long, with 1–4 articles, 2–5 mm between articles, glabrous or sparsely puberulent at ends; articles with thin flesh, 17–26 by 9.5–22 mm, ellipsoid, symmetrical, apex acute. *Seeds* ruminant or longitudinally ridged, 13–16.7 by 6–7.3 by 5.2–7.5 mm.

Distribution — New Caledonia.

Habitat — In forest on calcareous, serpentine and micaschist soils at 500–900 m altitude.

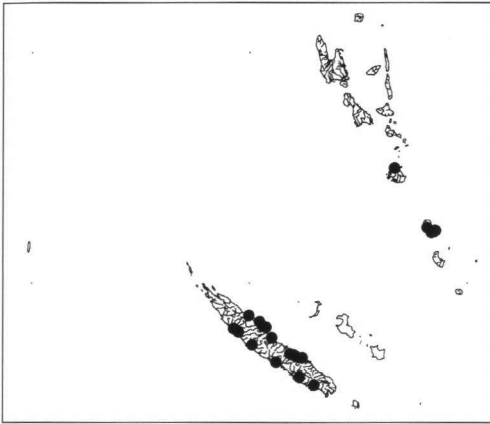
Notes — There seems to be some confusion about this name. Schlechter (1906) first published *A. obovata* Schltr. var. *oubatchensis* with a type specimen given as *Schlechter 15562*. Guillaumin (1911) then listed *A. obovata* var. *oubatchensis* and also *A. oubatchensis*, with a type specimen *Schlechter 15582*, crediting the specific name to Schlechter who wrote this name on the specimens under the genus *Gynopogon* with *n.sp.* It seems extremely likely that the original listing of 15562 was a typing error for 15582 and that Schlechter never intended to indicate two separate taxa, just that he changed his mind on the name for the genus and the rank of the taxon between annotating the sheets as a new species and publishing it as a variety. I have come across no specimens of *Schlechter 15562* and they are possibly not even Apocynaceae. Given that Guillaumin did publish the name *A. oubatchensis* with the type specimen of *A. obovata* var. *oubatchensis* the correct authority for this combination is *A. oubatchensis* (Schltr.) Guillaumin. Boiteau (1981) gives *Gynopogon oubatchense* Schltr. ex Guillaumin in synonymy but I have found no evidence that Guillaumin ever used this combination or that the name was published prior to its publication in synonymy by Boiteau.

It is related to *A. loesneriana* but differs in the lack of bracteoles, the pubescent inflorescences, the frequently pubescent stems and leaves, and the larger flowers. It is also similar to *A. baillonii* from which it differs in the frequent pubescence on the underside of the leaves, the much less strongly discoloured leaves in *A. baillonii* and the longer sepals.

26. *Alyxia podocarpa* Van Heurck & Müll.Arg. — Map 21

Alyxia podocarpa Van Heurck & Müll.Arg. (1871) 197; Guillaumin (1948) 291; Boiteau (1981) 112. — *Pulassarium podocarpum* (Van Heurck & Müll.Arg.) Kuntze (1891) 417. — Type: *E. Vieillard 2959* (holo AWH; iso G, GH, K, P) from New Caledonia, Poinlotche near Gatope. *Alyxia spec. nov.?* Guillaumin (1932) 18. — Based on *S.F. Kajewski 477* (A, BISH, BO, K, NY, P, US) from Vanua Lava, Banks Group, Vanuatu.

Climber. *Branchlets* weakly angled, not lenticellate, sparsely puberulent. *Leaves* in whorls of 3; petiole 0.2–0.7 cm long, glabrous or pubescent; blade coriaceous, elliptic to obovate, apex rounded to obtuse, not mucronate, base cuneate, margin weakly in-



Map 21. Distribution of *Alyxia podocarpa* Van Heurck. & Müll. Arg.

rolled, weakly undulate, dark green and dull above, pale green beneath, blade 1.5–8 by 0.5–1.8 cm, 2.7–9 times as long as wide, midrib sunken above, intramarginal nerve not evident, secondary veins 29–32 pairs, weakly prominent to indistinct above, obscure beneath, tertiary venation obscure; glabrous beneath, glabrous or puberulent only on midrib above, not punctate beneath. *Inflorescence* 4-flowered, axillary, a simple unbranched pleiochasium, robust, glabrous or sparsely puberulent all over, 1.3–1.6 cm long; peduncle 0.3–0.5 cm long, 1 mm wide, weakly flattened or more or less terete; bracts persistent, deltoid, c. 1.5 by 1 mm; bracteoles two immediately beneath calyx; pedicels 0.7–1 mm long. *Sepals* ovate, apex obtuse, 1.1–1.4 by 1–1.2 mm, 0.9–1.4 times as long as wide, ciliate, glabrous outside and inside. *Corolla* bud head 2.2–2.5 mm long, 0.27–0.3 of bud length, ellipsoid, apex acute; tube throat with thickening, 5.5–7 mm long, 1.4–1.6 mm wide, 3.9–5.8 times as long as sepals, 2.6–2.8 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, apex obtuse, 2.1–2.5 by 1.5–2.1 mm, 1–1.4 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4.1–4.4 mm from corolla base which is 0.68–0.73 of tube length; anther apex 0.3–0.7 mm from corolla mouth; anthers 1.1–1.2 by 0.35–0.4 mm, 2.75–3.4 times as long as wide; filament 0.4–0.6 mm long. *Ovary* 0.7–1 mm high, densely pubescent all over; style 2.2–4.1 mm long; pistil head 0.5–0.7 mm long. *Fruit* with 2–8 articles, 4–6 mm between articles, densely puberulent with slightly yellowish hairs, endocarp very hard; articles 7.2–12 by 5.7–9 mm, subglobose, symmetrical, apiculate. *Seeds* ruminant, c. 5.5 by 4.5 by 3.4 mm.

Distribution — New Caledonia, Vanuatu.

Habitat — In forest on serpentine, calcareous or schist soils at 5–250 m altitude.

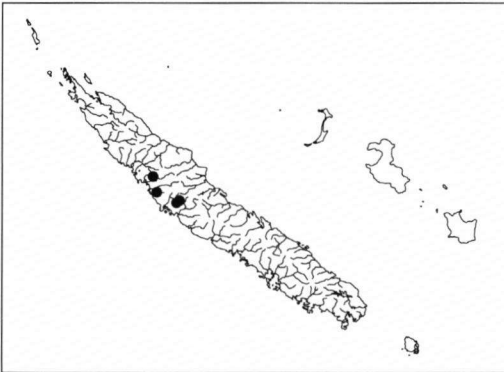
Note — Guillaumin (1932) mentioned an *Alyxia spec. nov.?*, based on *Kajewski 477* from Vanua Lava Island in the Banks Group of the New Hebrides (= Vanuatu). This material is in fruit, as are a number of other specimens from Vanuatu which match it, but it seems to be a specimen of *A. podocarpa*, a species previously thought to be endemic to New Caledonia. The discovery of flowering material in Vanuatu may alter this conclusion.

27. *Alyxia poyaensis* (Boiteau) D.J. Middleton, *comb. nov.* — Map 22

Alyxia rubricaulis subsp. *poyaensis* Boiteau in Boiteau & L. Allorge (1979) 453; Boiteau (1981) 154. — Type: *R. Schmid 168* (holo P) from New Caledonia, Mt Poya.

Alyxia spec. Däniker (1933) 383. — *Alyxia cf. brevipes* Däniker (1933) 380. — Based on *A. U. Däniker 898* (Z). The same specimen is discussed twice in different parts of Däniker's paper.

Erect shrubs or shrubs with arching stems, to 1.5 m high; bark red. *Branchlets* strongly angled, flattened between nodes with alternate nodes in opposite planes, sparsely lenticellate, glabrous. *Leaves* opposite; petiole 0.3–0.5 cm long, glabrous; blade coriaceous, narrowly to broadly elliptic, apex retuse to acute but always also ultimately mucronate, base obtuse to decurrent onto petiole, margin weakly inrolled or flat, weakly undulate, dark green and shining above, pale green beneath, 1.1–5.4 by 0.2–2.1 cm, 1.6–10 times as long as wide, midrib flattened or slightly sunken above, intramarginal nerve strong or weak and inset from margin, secondary veins 16–21 pairs, c. 60° from midrib, weakly prominent or flattened and indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent or flattened above, reticulate, parallel to secondary veins or obscure; glabrous beneath and above, not punctate beneath. *Inflorescence* axillary, a simple 3-flowered unbranched pleiochasium, delicate, glabrous or sparsely puberulent in upper parts, 2.3–3.8 cm long; peduncle 1.1–2.2 cm long, 1–1.8 mm wide, strongly flattened; bracts persistent, deltoid, 1.1–2 by 1.1–1.6 mm; bracteoles two immediately beneath calyx; pedicels 2–8.5 mm long. *Sepals* ovate, apex acute, 1.3–1.4 by 1–1.3 mm, 1–1.4 times as long as wide, ciliate, glabrous outside, pubescent only at tips or glabrous inside. *Corolla* with a yellowish tube, reddish at base, and white lobes; bud head 2.8 mm long, 0.33 of bud length, ovate, apex acuminate, columnar, 5.8–7 mm long, 1.5–1.9 mm wide, 4.1–4.5 times as long as sepals, 1.9–2.1 times as long as lobes, glabrous outside, pubescent in upper half and around stamens or sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic or ovate, apex obtuse to acute, 2.3–3 by 1.5–1.7 mm wide, 1.4–2 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4.4–4.7 mm from corolla base which is 0.63–0.69 of tube length; anther apex 0.8–1 mm from corolla mouth; anthers c. 1.4 by 0.5 mm, 2.8 times as long as wide; filament c. 0.4 mm long. *Ovary* 0.8–0.9 mm high, densely pubescent all over; style 3.2–3.7 mm long; pistil head 0.5–0.8 mm long. *Fruit* with 1 or 2 articles; articles with thin flesh, 7–7.3 by 4.7–4.9 mm, ellipsoid, symmetrical, obtuse or acute. *Seeds* not seen.



Map 22. Distribution of *Alyxia poyaensis* (Boiteau) D.J. Middleton.

Distribution — New Caledonia.

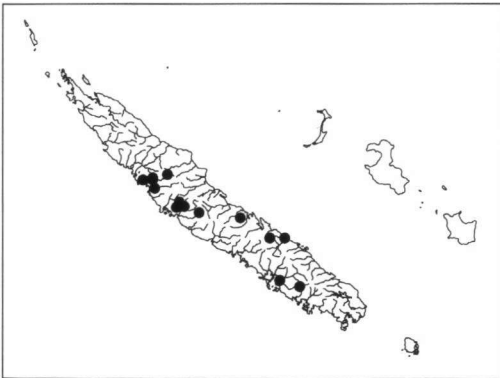
Note — This species is close to *A. rubricaulis* but differs from it in the attenuate leaf base, the leaf blade apex always being mucronate even when the leaf is rounded, the fewer flowered inflorescences and the extremely flat peduncles by which it is most readily identified.

28. *Alyxia rubricaulis* (Baill.) Guillaumin — Map 23

Alyxia rubricaulis (Baill.) Guillaumin (1941) 366; (1948) 291; Boiteau (1981) 152. — *Gynopogon rubricaulis* Baill. (1889a) 776. — Type: *B. Balansa* 2826 (lecto P, designated by Boiteau (1981), step 1, and here, step 2; iso BM, K, P) from New Caledonia, Foniambéré, base of Mt Mou.

Alyxia rubricaulis var. *boulindae* R.R. Brooks (1987) 339, nom. nud.

Climbers; bark red. *Branchlets* weakly angled, sparsely lenticellate, glabrous. *Leaves* opposite; petiole 0.6–1.2 cm long, glabrous; blade coriaceous or thickly coriaceous, elliptic or ovate, apex retuse to acuminate, mucronate or not, base obtuse to acute, margin weakly inrolled or flat, weakly undulate, 1.4–8.2 by 0.7–3.2 cm, 1.5–3.2 times as long as wide, strongly discolorous, midrib sunken above, intramarginal nerve distinct at margin or absent, secondary veins 11–24 pairs, 65–70° from midrib, prominent or indistinct above, obscure to weakly prominent beneath, tertiary venation obscure or weakly visible beneath; glabrous beneath and above, not punctate beneath. *Inflorescence* 7–11-flowered, axillary, with 1 or 2 internodes and unbranched side branches or of first order dichasial branching and second order alternate branches, glabrous, 2–3.5 cm long; peduncle 0.7–1.7 cm long, 1.4–1.5 mm wide, weakly flattened; bracts persistent, deltoid, 1–1.8 by 0.8–1.5 mm; bracteoles two on pedicel or absent; pedicels 0.8–5.8 mm long. *Sepals* ovate, apex acute, not reflexed, 1.3–1.8 by 1–1.4 mm, 1.3 times as long as wide, ciliate or not, glabrous outside and inside. *Corolla* with an orange tube and yellow lobes; bud head 1.3 mm long, 0.31 of bud length, ovate, apex acute or acuminate; tube slightly to strongly inflated, 3.2–4.2 mm long, 1.4–1.9 mm wide, 2.3–2.5 times as long as sepals, 2.3–3 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate or orbicular, apex obtuse or acute, 1.4 by 1.1–1.4 mm, 1–1.3 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 2.6 mm from corolla base which is 0.62 of tube length; anther apex 0.4 mm from corolla mouth;



Map 23. Distribution of *Alyxia rubricaulis* (Baill.) Guillaumin.

anthers 1.1 by 0.3–0.4 mm, 2.75–3.7 times as long as wide; filament 0.4 mm long. *Ovary* 0.9–1 mm high, densely pubescent all over; style 1.6 mm long; pistil head 0.5 mm long. *Fruit* stalk 2–3.8 mm long; with 1 or 2 articles, 1.9 mm between articles, glabrous or sparsely puberulent at ends; articles with thin flesh, 11.5–17 by 7–8.1 mm, ellipsoid, symmetrical, apex rounded or obtuse. *Seeds* elliptic, ruminate or longitudinally ridged, 10.2–11.2 by 5.5–6.2 by 5.4–5.9 mm. Embryo linear, straight at base, 10.5 mm long, cotyledons 0.71 of embryo length.

Distribution — New Caledonia.

Habitat — Scrub, mesophytic forest, maquis or forested ravine, on serpentine, at 10–800 m altitude.

29. *Alyxia ruscifolia* R.Br. — Map 24

Alyxia ruscifolia R.Br. (1810) 470; Roem. & Schult. (1819) 439; Spreng. (1824) 835; Lodd. (1832) t. 1811; G. Don (1837) 96; A. DC. (1844) 347; Benth. (1869) 308; Stanley & E.M. Ross (1986) 305; P.I. Forst. (1992) 549; G.J. Harden & J.B. Williams (1992) 516; Green (1994) 277; P.I. Forst. (1996) 127. — *Pulassarium ruscifolium* (R.Br.) Kuntze (1891) 417. — *Gynopogon ruscifolius* (R.Br.) K. Schum. (1895) 151. — Type: *R. Brown Iter Australiense* 2855 (lecto BM, designated by Forster (1992); iso BM, CANB, E) from Australia, Queensland, Wide Bay District, Hervey's Bay, Sandy Cape.

Alyxia ruscifolia var. *pugioniformis* A. Cunn. ex G. Don (1838) 96; A. DC. (1844) 347; Stanley & E.M. Ross (1986) 305. — *Gynopogon pugioniformis* A. Cunn. ex Steud. (1840) 714, nom. nud. — *Alyxia pugioniformis* A. Cunn. ex B.D. Jacks. (1893) 99, nom. nud. — Type: *A. Cunningham* 31 (lecto K) from Australia, Queensland, Brisbane River.

Alyxia richardsonii Sweet (1826) 273, nom. nud.

Alyxia ruscifolia var. *ulicina* F.M. Bailey (1883) 306; Stanley & E.M. Ross (1986) 305. — Type: *Unknown collector s.n.* (lecto BRI, designated by Forster (1992)).

Alyxia sharpei P.I. Forst. (1992) 563; (1996) 130. — Type: *P.I. Forster & A.R. Bean PIF5701* (holo BRI; iso MEL, QRS) from Australia, Queensland, Port Curtis District, State Forest 121, Scientific area 54.

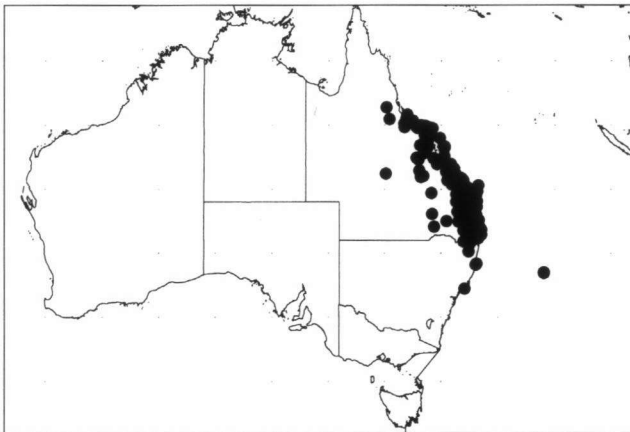
Erect rigid shrubs, 1–3 m high. Bark brown or grey. *Branchlets* weakly angled, sparsely lenticellate or not, sparsely to densely puberulent, turning glabrous with age. *Leaves* in whorls of 3–6; petiole 0.15–0.2 cm long, glabrous or pubescent; blade subcoriaceous to thickly coriaceous (these especially from Lord Howe Island), narrowly to broadly elliptic or obovate, apex obtuse to acuminate, sharply mucronate, base obtuse to cuneate, margin flat to strongly inrolled, weakly undulate or not, 0.6–6.3 by 0.2–3.1 cm, 1.3–4.2 times as long as wide, midrib slightly sunken above, intramarginal nerve absent, secondary veins 11–15 pairs, 20–45° from midrib, strongly prominent to indistinct above, obscure to weakly prominent beneath, tertiary venation weakly prominent or flattened above, reticulate, parallel to secondary veins, or obscure; glabrous or sparsely puberulent only on midrib beneath, glabrous to puberulent above, or with a few hairs along the margin, not punctate beneath. *Inflorescence* mostly terminal, occasionally also axillary, flowers solitary or in a short congested 2–8-flowered compound pleiochasium, delicate, glabrous, 0.7–1.1 cm long; bracts persistent, ovate or lanceolate, 0.8–1.8 by 0.6–1.1 mm; pedicels 0–0.5 mm long. *Sepals* ovate or lanceolate, apex obtuse or acute, not reflexed, not keeled, 1.5–2.6 by 0.8–1.2 mm, 1.4–2.25 times as long as wide, ciliate or not, glabrous, sparsely puberulent or puberulent on tips only outside, pubescent only at tips or glabrous inside. *Corolla* white, cream, or with a pink

tube and white lobes; bud head 2.6–3 mm long, 0.33–0.5 of bud length, lanceolate or ovate, apex acute to acuminate; tube columnar or slightly inflated, throat with thickening, 4.3–7.2 mm long, 1.1–2 mm wide, 2.4–3.8 times as long as sepals, 1.5–2.5 times as long as lobes, glabrous or sparsely puberulent around middle of tube outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, oblong or ovate, apex rounded to acuminate, 1.7–3.8 by 0.75–2.7 mm, 1.3–2.5 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 2.5–5.1 mm from corolla base which is 0.51–0.73 of tube length; anther apex 0.5–1.6 mm from corolla mouth; anthers 0.8–1.3 by 0.3–0.5 mm, 2–2.9 times as long as wide; filament 0.3–0.5 mm long. *Ovary* 0.5–0.9 mm high, densely pubescent all over to pubescent around base only; style 1.6–3.4 mm long; pistil head 0.4–0.7 mm long. *Fruit* red, rarely orange; stalk 2–2.1 mm long; with 1 article; glabrous; articles with thin flesh, 8.5–11.5 by 7–11 mm, globose or subglobose, rounded or obtuse at apex. *Seeds* ruminant, 5.9–7.9 by 6.4–7.2 by 5.1–5.7 mm. Embryo linear, straight at base, cotyledons 7.1 mm long, 0.56 of embryo length.

Distribution — Eastern Australia, Lord Howe Island.

Habitat — In or on the edge of forest.

Typification — Forster (1992) lectotypified *A. ruscifolia* var. *pugioniformis* A. Cunn. ex G. Don with *Cunningham 30* (K). However, this plant was collected in 1829 and Don's description makes clear that he is basing his taxon on the manuscript version of the name by Cunningham from 1828, meaning that *Cunningham 30* cannot be the specimen on which the name was based. There are two other Cunningham specimens in Kew labelled as *A. pugioniformis*, numbers *31* and *171*. *Cunningham 171* is labelled as having been collected in September 1828 but otherwise has little annotation. *Cunningham 31* has no year of collection on it but has an extensive Latin description of *A. pugioniformis* and it seems likely that this is the plant on which Cunningham based the manuscript name and, therefore, it should be chosen as the lectotype. There is another *Cunningham 30* specimen in Kew which is a specimen of *A. gynopogon*. The combination *A. pugioniformis* A. Cunn. (1834: t. 3312), nom. inval. has been given in



Map 24. Distribution of *Alyxia ruscifolia* R.Br.

several publications (Forster, 1992, 1996) and in Index Kewensis. It is more or less certain that the name was intended to be given in synonymy of *A. ruscifolia* in this publication so was not accepted at the time of publication and is, therefore, invalid. However, it appears to me that the author intended to synonymise *A. ruscifolia* var. *pugioniformis* by the indication of (b) *pugioniformis* rather than the full combination he gave for the other synonyms which would indicate that the combination *A. pugioniformis* was not published until provided in Index Kewensis (1893), still as a nomen nudum.

Notes — Forster (1992) described two new subspecies in *A. ruscifolia*, namely subsp. *tropica* and subsp. *major*, and presented a table of how they differ from each other and from the type subspecies. In Part 1 of this revision (Middleton, 2000) I have already noted that subsp. *major* should be raised to specific rank and that the specimens collected in Malesia belong to this taxon rather than to subsp. *tropica* as suggested by Forster. Subsp. *tropica* has also been raised to specific rank. Unfortunately these three taxa cannot be distinguished with vegetative or fruiting material and the type specimen of *A. oblongata* is in fruit. However, from its collection locality it can only be the taxon which Forster described as *A. ruscifolia* subsp. *major*. The reasons for recognising them as distinct species rather than subspecies are largely in agreement with Forster, the major difference being in the rank. The reason I have chosen to raise the northern taxa to specific rank is to preserve some consistency in the status of taxa in the whole genus and in Australia in particular. Forster does point out that his solution for recognising the variability in *A. ruscifolia* must be viewed as a logical and pragmatic compromise in view of the lack of information on the breeding barriers, or otherwise, between populations, but the solution proposed here recognises that species recognised on discontinuities in morphological characters alone, which is the case in virtually the whole genus with our current level of knowledge, have to be treated in a consistent way.

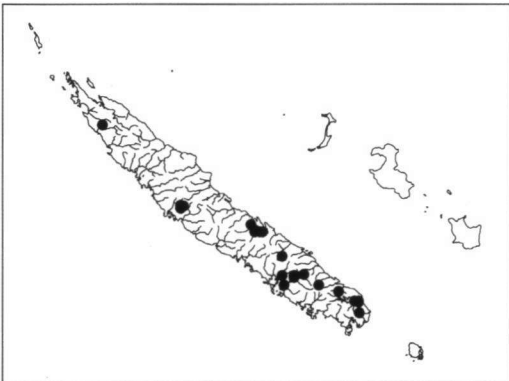
Alyxia sharpei was distinguished from *A. ruscifolia* by Forster (1992) by its long narrow revolute leaves which are concolorous on both sides. At first sight these two species do appear very distinct but there are also many specimens previously identified as *A. ruscifolia* var. *ruscifolia* which have leaves just as strongly revolute but with much shorter laminas (e.g. *Willis s. n.* collected on 5 June 1961 from the Bunya Mts). In these cases, both those identified as *A. sharpei* and *A. ruscifolia*, the leaves are considerably more pubescent above than is usual in *A. ruscifolia*. In some of these specimens there are narrow and strongly revolute leaves on the same specimen as wider and only weakly revolute leaves. In several species from New Caledonia and the Pacific Islands there are also large differences in leaf shape and size within single species such as *A. tisserantii*, *A. margaretae* and *A. stellata*. To a lesser degree this variation can be seen in Malesian species such as *A. luzoniensis* and *A. reinwardtii*. Boiteau (1981) has suggested that the forms with long narrow leaves are the juvenile stage which can then also be neotonous so that even the juvenile form is fertile. Forster (1992: 556) notes, however, that plants with broader leaves tend to have seedlings with broader leaves and conversely for narrower leaves. He does note, though, that there are exceptions to this trend. Far more studies are necessary in this area to reach a clearer understanding of leaf shape and size variation within species but due to the presence of many intermediates *A. sharpei* cannot be maintained.

Any future, more detailed, examination of this *A. ruscifolia*/*A. oblongata*/*A. tropica* complex must also include the closely related *A. gynopogon*, *A. magnifolia*, *A. ilicifolia*, and possibly *A. orophila*, in an analysis.

30. *Alyxia sarasinii* Guillaumin — Map 25

Alyxia sarasinii Guillaumin (1941) 366; (1948) 290; Boiteau (1981) 132. — Type: *K. F. Sarasin 701* (lecto P, designated by Boiteau (1981); isolecto Z) from New Caledonia, between Yaté and la plaine des Lacs. Syntype: *B. Balansa 2441* (P).

Erect shrubs or shrubs with densely packed arching stems, 1.5–2 m high, often flat-topped. *Branchlets* weakly angled, sparsely lenticellate or not, glabrous to densely and minutely puberulent, often becoming glabrescent. *Leaves* in whorls of 3; petiole 0.2–0.5 cm long, pubescent; blade thickly coriaceous, elliptic or obovate, apex retuse to obtuse, not mucronate, base cuneate, margin weakly to strongly inrolled, not undulate, 0.8–2.4 by 0.3–1 cm, 1.7–3.8 times as long as wide, midrib slightly sunken or raised and with a central groove above, intramarginal nerve absent, secondary veins 9 or 10 pairs, weakly distinguishable or indistinct above, obscure beneath, tertiary venation obscure; densely to sparsely puberulent all over beneath, above glabrous, puberulent only on midrib, or puberulent all over, not punctate beneath. *Inflorescences* axillary or terminal, concentrated near tips of branches, a simple 3–10-flowered unbranched pleiochasium or short congested compound pleiochasium, robust, densely puberulent, 1–2.8 cm long; peduncle 0.5–1.2 cm long, 1.1–1.2 mm wide, weakly flattened; bracts caducous or persistent, lanceolate, 2–2.9 by 1–1.6 mm; bracteoles one or two on pedicel; pedicels 1–8 mm long. *Sepals* oblong, leafy, apex rounded to obtuse, slightly to strongly reflexed, keeled, 3–3.9 by 1.3–1.5 mm, 2.1–3 times as long as wide, ciliate, densely puberulent, of similar sizes, pubescent over upper half inside, short all over. *Corolla* white, fragrant; bud head 2.7 mm long, 0.44 of bud length, ellipsoid, apex acute; tube columnar, 3.3–4 mm long, 1.1–1.5 mm wide, 1–1.2 times as long as sepals, 1.3–1.75 times as long as lobes, densely puberulent outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate, apex acuminate, 2–2.9 by 1.4–1.7 mm, 1.4–1.7 times as long as wide, densely puberulent outside, pubescent all over lobes inside, ciliate. *Stamens* inserted



Map 25. Distribution of *Alyxia sarasinii* Guillaumin.

at 1.7–1.9 mm from corolla base which is 0.49–0.7 of tube length; anther apex 0.6–0.8 mm from corolla mouth; anthers 1.1–1.2 by 0.35–0.4 mm, 2.75–3.1 times as long as wide; filament 0.5 mm long. *Ovary* 0.6–0.8 mm high, densely pubescent all over; style 0.5–0.6 mm long; pistil head 0.7 mm long. *Fruit* black, stalk 1 mm long, with 1 or 2 articles, 0–0.5 mm between articles, sparsely puberulent all over; articles fleshy, 2.5–6 by 2.5–5 mm, globose, symmetrical, apex rounded. *Seeds* ovoid, ruminate, c. 3 by 3 by 3 mm. Embryo linear, cotyledons c. 2.7 mm long, c. 0.37 of embryo length.

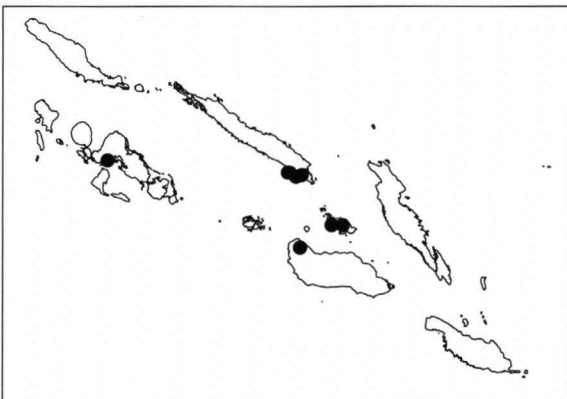
Habitat — In scrub, maquis, degraded maquis or forest remnants on serpentine or curasse de fer soils at 20–1150 m altitude.

Note — This species is most closely related to *A. clusiophylla* from which it differs most noticeably in the pubescent outside to the corolla tube but also in general facies and leafier sepals.

31. *Alyxia solomonensis* D.J. Middleton, *spec. nov.* — Fig. 3, Map 26

Frutex scandens. Folia 4–5-verticillata subcoriacea elliptica vel obovata. Inflorescentiae axillares 5–6-florae. Folia dense pubescentes 1.5–2.2 cm longae. Corolla tubo 5–7 mm longo lobis 3.1–3.2 mm longis. Ovarium pubescens. Mericarpiis 1-articulata articulis ellipticis vel subglobosis 11–21 by 9.3–11.5 mm. — *Typus*: *I. Gafui et al.* BSIP15084 (holo L; iso K, LAE, SING) from the Solomon Islands, Big Nggela, North of Haleta Village.

Climbers. Bark grey, smooth. *Branchlets* strongly angled when young, weakly angled when mature, not lenticellate, sparsely to densely and minutely puberulent, becoming glabrescent. *Leaves* in whorls of 4 or 5; petiole 0.4–0.7 cm long, glabrous; blade subcoriaceous, narrowly elliptic, elliptic, or obovate, apex acuminate, not mucronate, base cuneate, margin not inrolled, weakly undulate, 5.4–12 by 1.3–3.9 cm, 2.5–4.2 times as long as wide, midrib sunken above, intramarginal nerve weakly present, secondary veins 42–48 pairs, 60–70° from midrib, weakly prominent above and beneath, tertiary venation weakly prominent to obscure above, reticulate or parallel to secondary veins; glabrous beneath and above, not punctate beneath. *Inflorescence* 5- or 6-flowered, axillary, a simple unbranched pleiochasium or with 1 or 2 internodes and unbranched side branches, densely puberulent, 1.5–2.2 cm long; peduncle 0.3–0.7 cm long, 0.9–



Map 26. Distribution of *Alyxia solomonensis* D.J. Middleton.

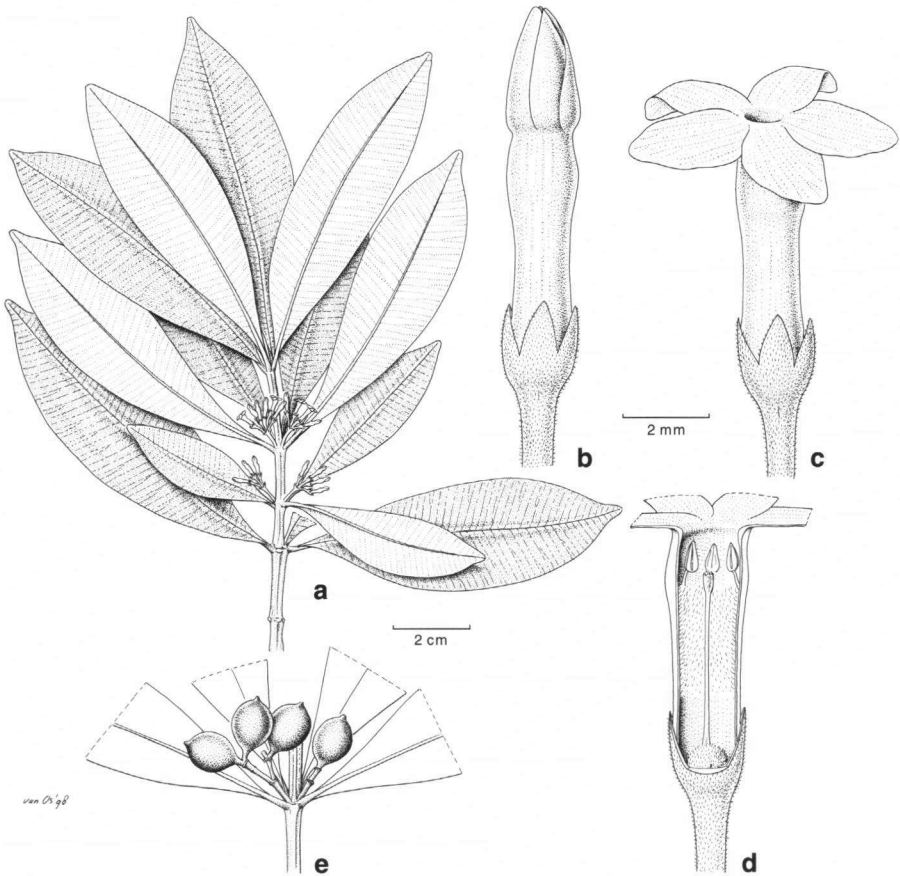


Fig. 3. *Alyxia solomonensis* D.J. Middleton. a. Habit; b. flower in bud; c. flower; d. flower dissection; e. fruit (Gafui et al. BSIP15084).

1.3 mm wide; bracts caducous; bracteoles absent or only on pedicel of terminal flower; pedicels 1.8–4.8 mm long. *Sepals* ovate, apex obtuse to acute, 1.5 by 0.8–1.2 mm, 1.25–1.9 times as long as wide, ciliate, densely puberulent outside, pubescent only at tips inside. *Corolla* white or white with an orange tube; bud head 2.5 mm long, 0.27 of bud length, ellipsoid, apex acute; tube columnar, 5–7 mm long, 1.1 mm wide, 3.3–4.7 times as long as sepals, 1.6–2.2 times as long as lobes, with few hairs at top of tube outside, inside continuously pubescent except for base or sparsely pubescent around stamens and more densely in a band beneath them; lobes elliptic, apex rounded to obtuse, 3.1–3.2 by 1.9–2.9 mm, 1.5–1.6 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 4–6.1 mm from corolla base which is 0.71–0.8 of tube length; anther apex 0.3–0.4 mm from corolla mouth; anthers 0.8–0.9 by 0.3–0.4 mm, 2.25–2.7 times as long as wide; filament 0.5 mm long. *Ovary* 0.5 mm high, densely pubescent all over; style 3.9–5.2 mm long; pistil head 0.5–0.7 mm long. *Fruit* stalk 2–2.5 mm long, with 1 article, sparsely puberulent at ends or all over;

articles with thin flesh, 11–21 by 9.3–11.5 mm, ellipsoid or subglobose, symmetrical, apex rounded to acute, or apiculate. *Seeds* ruminant, c. 13.5 by 9 by 8.5 mm. Embryo widening at the cotyledons which are strongly undulate and c. 12.8 mm long, 0.7 of embryo length.

Distribution — Solomon Islands.

Habitat — Primary forest or *Casuarina* forest, reported from well-drained ultrabasic soil, at 43–750 m altitude.

Note — Specimens of this new species were often named as *A. acuminata*, or one of its synonyms, in the herbarium. However, that species is confined to New Guinea and the specimens so-named from the Solomon Islands belong to either *A. kwalotabaa* or *A. solomonensis*. This new species is not particularly close to either *A. acuminata* or *A. kwalotabaa* and is probably most closely related to *A. stellata*. The clearest character on the local level to distinguish the two species is the pubescent inflorescence of *A. solomonensis*. This character is of rare occurrence in the extremely variable *A. stellata* but in the cases where it occurs in that species the corolla is very much smaller than in *A. solomonensis*.

32. *Alyxia spicata* R.Br. — Map 27

Alyxia spicata R.Br. (1810) 470; Roem. & Schult. (1819) 439; Spreng. (1824) 835; G. Don (1838) 96; A.DC. (1844) 346; F. Muell. (1868) 117; Benth. (1869) 308; F.M. Bailey (1883) 306; Engl. (1886) 470; F.M. Bailey (1890) 29; (1900) 980; Ewart & O.B. Davies (1917) 222; Markgr. (1927) 185; Domin (1928) 524; Markgr. (1977) 391; Wheeler (1992) 702; P.I. Forst. (1992) 569; (1996) 131; D.J. Middleton (2000) 123. — *Pulassarium spicatum* (R.Br.) Kuntze (1891) 417. — *Gynopogon spicatus* (R.Br.) Britten in Banks & D. Sol. (1901) 60. — Type: *R. Brown Iter Australiense 2857* (lecto BM, designated by Forster (1992); isolecto E, P) from Australia, Northern Territory, Carpentaria, Vanderlin Island.

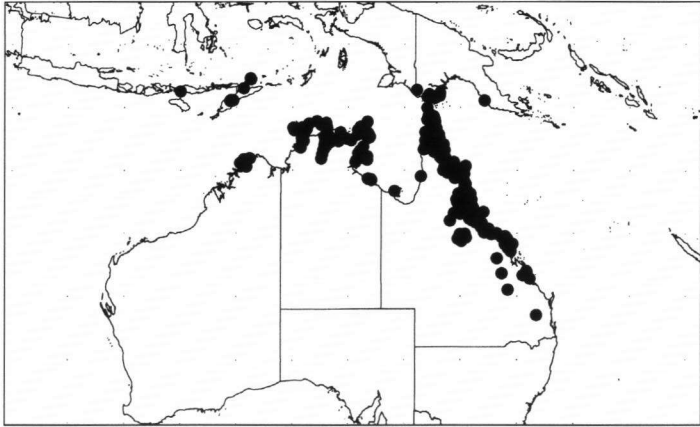
Alyxia tetragona R.Br. (1810) 470; Roem. & Schult. (1819) 439; Spreng. (1824) 835; G. Don (1838) 96; A.DC. (1844) 346. — Type: *J. Banks & D. Solander s.n.* (BM, designated by Forster (1992); iso BM) from Australia, Queensland, Cook District, Endeavour River.

Fagraea tetragona Span. (1841) 326. — *Alyxia spanogheana* Miq. (1857) 409; Markgr. (1977) 401. — *Pulassarium spanogheanum* (Miq.) Kuntze (1891) 417. — Type: *J.B. Spanoghe s.n.* (no specimens found). Lectotype: Spanoghe illustration in Leiden (941.6-217), designated by Markgraf (1977).

Alyxia thyrsiflora Benth. (1869) 309. — *Alyxia thyrsifolia* P.I. Forst. (1992) 570 sphalm. — *Pulassarium thyrsiflorum* (Benth.) Kuntze (1891) 417. — Type: *Dallachy & Fitzalan s.n.* (lecto K, designated by Forster (1992); isolecto MEL) from Australia, Queensland, Port Denison.

Alyxia acuminata auct. non Markgr.: Markgr. (1977) 390, p.p.

Climbers or shrubs 1–3 m high, usually then with arching stems, sometimes forming more or less erect shrubs by stems twining round each other. Bark brown or grey, rough. *Branchlets* square in cross section or weakly to strongly angled, not to densely lenticellate, glabrous or sparsely puberulent, becoming glabrescent. *Leaves* opposite, particularly in young plants, or in whorls of 3 or 4; petiole 0.2–1 cm long, glabrous or pubescent; blade coriaceous, subcoriaceous or papery, narrow elliptic, elliptic, or obovate, apex retuse to acuminate, not mucronate, base obtuse to cuneate, margin weakly inrolled or flat, weakly to strongly undulate, 1.5–11.1 by 0.7–4.1 cm, 1.5–5.3 times as long as wide, midrib prominent, flattened, or raised and with a central groove above, secondary veins 17–40 pairs, 70–75° from midrib, strongly to weakly prominent above,



Map 27. Distribution of *Alyxia spicata* R. Br.

obscure to weakly prominent beneath, tertiary venation weakly prominent or flattened above, reticulate, parallel to secondary veins, or branching off from secondary veins; glabrous to puberulent all over beneath, glabrous or puberulent only on midrib above, not punctate beneath. *Inflorescence* 12–15-flowered, axillary, a compound pleiochasium with distinct internodes or with several distinct internodes and unbranched side branches, sparsely to densely puberulent all over, 1.2–3.2 cm long; peduncle 0.3–1.4 cm long, 0.8–1.1 mm wide, weakly flattened; bracts caducous or persistent, deltoid or lanceolate, 1.7–2.6 by 0.7–2.6 mm; bracteoles one immediately beneath calyx, two immediately beneath calyx, or two on pedicel; pedicels 0–1.1 mm long. *Sepals* ovate or lanceolate, often fused for up to half their length, apex obtuse to acute, 0.9–2.2 by 0.6–1.2 mm, 1.1–3 times as long as wide, ciliate, glabrous to densely puberulent outside, pubescent over upper half inside. *Corolla* lobes white, yellow or greenish, tube white, yellow, brownish, or orange, sometimes tinged pink, fragrant; bud head 1.4–2.5 mm long, 0.44–0.51 of bud length, ellipsoid or lanceolate, apex rounded to acuminate; tube columnar or rather inflated, 2–3 mm long, 0.8–1.3 mm wide, 1–2.7 times as long as sepals, 0.96–2 times as long as lobes, glabrous or rarely sparsely puberulent around top of tube outside, inside pubescent in upper half and around stamens, pubescent only in a band below the stamens, sparsely pubescent around stamens and more densely in a band beneath them; lobes linear, elliptic, oblong or ovate, apex rounded to acuminate, 1.2–2.5 by 0.5–1.4 mm, 1.1–4.6 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 1.3–2.1 mm from corolla base which is 0.52–0.7 of tube length; anther apex 0–0.6 mm from corolla mouth; anthers 0.6–0.9 by 0.2–0.4 mm, 1.5–3 times as long as wide; filament 0.2–0.6 mm long. *Ovary* 0.4–0.8 mm high, glabrous, densely pubescent all over or pubescent only on top; style 0.8–1.4 mm long; pistil head 0.2–0.6 mm long. *Fruit* yellow, black, yellow-orange or orange, stalk 1–2.9 mm long, with 1–4 articles, 1.3–2.5 mm between articles, glabrous; articles fleshy or with thin flesh, 7.6–13 by 6.9–11 mm, globose or subglobose, symmetrical, apex rounded. *Seeds* ovoid, ruminant, 7.6–9 by 6–7.2 by 5.3–6.7 mm. Embryo widening at the cotyledons which are strongly undulate

or sinuate on one edge, flat on the other, 5.8–6.2 mm long, 0.65–0.69 of embryo length.

Distribution — Australia, Lesser Sunda Islands, New Guinea.

Note — The description above includes specimens collected in Malesia. Forster (1992) separates this species from *A. grandis* partly on the yellow fruit of *A. grandis* but label notes on the *A. spicata* specimens *Egan 2356* and *Waterhouse 3214* says the fruits are yellow when mature. Webb (1959) reports that a tonic prepared from the roots of this species is used by Australian Aboriginal people for relief from “short wind and breathlessness”.

33. *Alyxia squamulosa* C. Moore & F. Muell. — Map 9

Alyxia squamulosa C. Moore & F. Muell. in F. Muell. (1873) 47; P.S. Green (1994) 277. — *Pulassarium squamulosum* (C. Moore & F. Muell.) Kuntze (1891) 417. — Type: *C. Moore 56* (lecto MEL, designated by Green (1993); iso K) from Lord Howe Island.

Alyxia lindii F. Muell. (1873) 46; P.S. Green (1994) 277. — *Pulassarium lindii* (F. Muell.) Kuntze (1891) 417. — Type: *J. Lind & J.P. Fullagar 109* (holo MEL; iso BM (without number), BRI, MEL, K? (see note)) from Lord Howe Island.

Climbers. *Branchlets* weakly to strongly angled, sparsely lenticellate or not, glabrous. *Leaves* in whorls of 3 or 4; petiole 0.3–0.8 cm long, glabrous or pubescent; blade coriaceous or subcoriaceous, elliptic, obovate or spatulate, apex retuse to acute, not mucronate, base cuneate or decurrent onto petiole, margin weakly inrolled or flat, weakly to strongly undulate, 1.4–7.9 by 1.1–3 cm, 1.4–3.9 times as long as wide, midrib raised and with a central groove above, intramarginal nerve absent, secondary veins 17–34 pairs, 70–85° from midrib, weakly prominent or indistinct above, obscure beneath, tertiary venation weakly prominent or obscure above; glabrous beneath, glabrous above, punctate or not punctate beneath. *Inflorescence* 4–6-flowered, axillary or terminal, a short congested compound pleiochasium or a compound pleiochasium with distinct internodes, robust, sparsely puberulent in upper parts to densely puberulent all over, 1.7–3.5 cm long; peduncle 0.3–1.6 cm long, 1.3–1.7 mm wide, weakly flattened or more or less terete; bracts persistent, deltoid, leafy or lanceolate, 1.9–5 by 1.4–2.2 mm; bracteoles present, several along pedicel, rarely only two; pedicels 0.5–4.5 mm long. *Sepals* ovate, apex rounded to acute, not reflexed, 2.1–2.7 by 1.4–1.9 mm, 1.4–1.9 times as long as wide, ciliate, glabrous outside, of similar sizes, pubescent only at tips or glabrous inside. *Corolla* white, fragrant; bud head 3.4–4.5 mm long, 0.34–0.45 of bud length, lanceolate or ovate, apex acute or acuminate; tube columnar, 4.6–8 mm long, 2–2.5 mm wide, 2.1–3 times as long as sepals, 1.2–1.7 times as long as lobes, glabrous outside, pubescent in a band below the stamens or sparsely pubescent around stamens and more densely in a band beneath them inside; lobes oblong, ovate or orbicular, apex rounded to acute, 3.2–5 by 1.5–4.8 mm, 0.9–2.5 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 3.9–4.2 mm from corolla base which is 0.56–0.58 of tube length; anther apex 1.1 mm from corolla mouth; anthers 1.4 by 0.4–0.6 mm, 2.3–3.5 times as long as wide; filament 0.6–0.7 mm long. *Ovary* 0.8–0.9 mm high, densely pubescent all over; style 3.1–3.2 mm long; pistil head 1.1 mm long. *Fruit* orange-brown, stalk 2.5–3 mm long, with 1 or 2 articles, 0–0.5 mm between articles, glabrous; articles fleshy or with thin flesh and

with a hard endocarp, 18–25.5 by 11.5–15 mm, ellipsoid, symmetrical or asymmetrical, apex obtuse or acute. *Seeds* ruminant or longitudinally ridged, c. 17 by 9 by 6 mm, with a tough endocarp.

Distribution — Lord Howe Island.

Habitat — In scrub or low closed forest on clay loam or deep loam on basalt.

Typification — The isotype of *A. lindii* in K is without collector's name or details so its type status is not entirely without doubt.

Note — The inflorescence is often of a dense aggregate of a terminal inflorescence with axillary inflorescences in the uppermost leaf axils which are all branched forming a many flowered head. Its affinities would appear to be with species such as *A. veillonii* or *A. clusiophylla* from New Caledonia rather than with Australian species.

34. *Alyxia stellata* (J.R. Forst. & G. Forst.) Roem. & Schult. — Fig. 4, Map 28

Alyxia stellata (J.R. Forst. & G. Forst.) Roem. & Schult. (1819) 439; Spreng. (1824) 835; Guill. (1836) 306; Endl. (1836) 175, n. 1245; Guill. (1837) 247, n. 245 (*Zephyritis* (1837) 47); G. Don (1838) 96; A.DC. (1844) 346; Nadeaud (1864) 37; Seem. (1866) 157; Nadeaud (1873) 56, n. 367; Hemsl. (1894) 184; Guillaumin (1911) 194; Setch. (1924) 58; F.Br. (1935) 230; Yunck. (1943) 97; (1959) 220; Fosberg (1968) 258; Hiepko (1969) 283, n. 5109; H. St. John (1971) 574; Fosberg & Sachet (1974) 253; M.L. Grant, Fosberg & H.M. Sm. (1974) 47; Sachet (1975) 21; Boiteau (1981) 137; A.C. Sm. (1988) 57; B. Hansen & P. Wagner (1998) 322; Welsh (1998) 35. — *Gynopogon stellatus* J.R. Forst. & G. Forst. (1775) 18, n. 1.; (1776) 36, n. 1; G. Forst. (1786) 19, n. 117; Willd. (1798) 1221; Spreng. (1813) 24; Drake (1893) 122; K. Schum. (1895) 151. — *Pulassarium stellatum* (J.R. Forst. & G. Forst.) Kuntze (1891) 417 — Type: *J.R. & G. Forster s.n.* (lecto P, designated by Boiteau (1981), step 1, and Fosberg (1993), step 2) — see typification notes.

Alyxia scandens (J.R. Forst. & G. Forst.) Roem. & Schult. (1819) 440; Spreng. (1824) 835; (1827) 109; Guill. (1837) 247; G. Don (1838) 96; A.DC. (1844) 348; F.Br. (1935) 232; Yunck. (1959) 219; Fosberg & Sachet (1974) 252; M.L. Grant, Fosberg & H.M. Sm. (1974) 49. — *Gynopogon scandens* J.R. Forst. & G. Forst. (1775) 18, n. 2; (1776) 36, n. 2. — *Pulassarium scandens* (J.R. Forst. & G. Forst.) Kuntze (1891) 417. — Type: *J.R. & G. Forster s.n.* (lecto BM, designated by Fosberg (1993)) from the Society Islands — see typification notes.

Alyxia obtusifolia R.Br. (1810) 470; Roem. & Schult. (1819) 439; Spreng. (1824) 835; (1827) 109; G. Don (1838) 96; A.DC. (1844) 346; Benth. (1869) 308; F.M. Bailey (1883) 306; (1890) 29; (1900) 980. — *Pulassarium obtusifolium* (R.Br.) Kuntze (1891) 417. — Type: *R. Brown Iter Australiense 2856* (lecto BM, designated by Forster (1992) [although in synonymy of *A. spicata*]; iso BM, CANB (without number), G (without number), K, MO, NY (without number), UC) from Australia, Queensland, Port Curtis District, Keppel Bay.

Alyxia oliviformis Gaudich. (1829) 451; G. Don (1838) 96; A.DC. (1844) 347; Hochr. (1931) 179; W.L. Wagner, D.R. Herbst & Sohmer (1990) 214; B.H. Krauss (1993) 224, t. 50; Mabb. (1998) 32, t. 7. — *Pulassarium oliviforme* (Gaudich.) Kuntze (1891) 417. — *Gynopogon oliviformis* (Gaudich.) K. Schum. (1895) 151. — Type: *C. Gaudichaud s.n.* (holo P; iso G (as *Gaudichaud 109*)) from Hawaii s.l.

Alyxia torresiana Gaudich. (1829) 451; G. Don (1838) 96; A.DC. (1844) 346. — *Gynopogon torresianus* (Gaudich.) K. Schum. & Lauterb. (1901) 504. — *Pulassarium torresianum* (Gaudich.) Kuntze (1891) 417. — Type: *C. Gaudichaud s.n.* (holo P; G-DC) from the Marianas s.l.

Alyxia sulcata Hook. & Arn. (1832) 90; G. Don (1838) 96; A.DC. (1844) 347. — *Pulassarium sulcatum* (Hook. & Arn.) Kuntze (1891) 417. — Type: *Beechy s.n.* (lecto K, designated here; iso G) from Hawaii, Oahu.

Alyxia thozetii F. Muell. (1877) 103. — *Pulassarium thozetii* (F. Muell.) Kuntze (1891) 417. — Type: *F.J.H. Mueller 966* (holo MEL) from Australia, Queensland, Muellerville.

- Alyxia myrtillifolia* (A. Gray ex Hillebr.) H. Lév. (1911) 155. — *Alyxia oliviformis* var. *myrtillifolia* A. Gray ex Hillebr. (1888) 299. — *Alyxia oliviformis* forma *myrtillifolia* (A. Gray ex Hillebr.) H. St. John (1975) 383. — Type: *W.B. Hillebrand s.n.* (lecto BISH, designated here; iso US (without a number)) from Hawaii, Maui Island, Waikapu). Syntypes: *W.B. Hillebrand & J.M. Lydgate s.n.* (BISH, BM) from Lanai.
- Alyxia oliviformis* var. *lanceolata* Hillebr. (1888) 299. — *Alyxia oliviformis* forma *lanceolata* (Hillebr.) H. St. John (1975) 382. — Type: *W.B. Hillebrand s.n.* (lecto BISH, designated here; iso BM, US) from Hawaii, Maui Island, Kaanapali.
- Alyxia oliviformis* var. *ovata* Hillebr. (1888) 299. — *Alyxia oliviformis* forma *ovata* (Hillebr.) H. St. John (1975) 383. — Type: *W.B. Hillebrand s.n.* (lecto BISH, designated here; iso BM, C, S, US) from the Hawaiian Islands s.l.
- Gynopogon brevipes* Baill. (1889a) 776. — *Alyxia brevipes* (Baill.) Schltr. (1906) 237; Däniker (1933) 379; Guillaumin (1948) 292. — Type: *B. Balansa 2427* (lecto P, designated here; iso K, P) from New Caledonia, Loyalty Islands, Lifou.
- Alyxia elliptica* Cheeseman (1903) 287. — Type: *T.F. Cheeseman s.n.* (lecto K, designated here; iso K) from Cook Islands, Rarotonga.
- Gynopogon apolimae* Rech. (1910) 331, t. 6. — *Gynopogon oliviformis* subsp. *apolimae* Rech. (1910) 331. — Type: *K. Rechinger & L. Rechinger 1021* (lecto W, designated here; iso BISH, W) from American Samoa, Apolima — see nomenclatural note.
- Alyxia intermedia* Vieill. ex Guillaumin (1911) 194, nom. nud.
- Alyxia palauensis* Markgr. — Type: *C.L. Ledermann 14080* (holo B) from Palau, Korror.
- Alyxia brevipes* var. *macrocarpa* Däniker (1933) 380. — Type: *A.U. Däniker 3105* (holo Z) from New Caledonia, Loyalty Islands, Maré, Pede peninsula.
- Alyxia stellata* forma *marquesensis* F.Br. (1935) 230. — *Alyxia stellata* var. *marquesensis* (F.Br.) Fosberg & Sachet (1974) 253. — Type: *E.H. Quayle 1721* (lecto BISH, designated here) from the Marquesas, Uahuka. Syntypes: *E.P. Mumford & A.M. Adamson 362* (BISH, UC), *F. Brown 562a* (BISH), *932* (BISH).
- Alyxia stellata* var. *fatuhivensis* Fosberg & Sachet (1974) 254. — Type: *F. Brown 932* (holo BISH) from the Marquesas, Fatuhiva Island.
- Alyxia stellata* forma *rapensis* F.Br. (1935) 231. — Type: *A.M. Stokes 94* (lecto BISH, designated here) from Tubuai Islands, Raivavae Island, Matotea, Eastern ridge. Syntypes: *A.M. Stokes 72* (BISH), *96* (BISH), *184* (BISH).
- Alyxia stellata* forma *magnacarpa* F.Br. (1935) 231. — Type: *A.M. Stokes 436* (lecto BISH, designated here; iso A, BISH, K, UC, US) from Tubuai Islands, Rapa Island, Akatanui.
- Alyxia linearifolia* A.C. Sm. (1942) 107; (1988) 61. — Type: *O. Degener 15396* (holo A; iso BISH, K, L, MO, NY, P, S, UC, US) from Fiji, Viti Levu, Ra, Vatundamu, Vicinity of Rewasa, near Vaileka.
- Alyxia stellata* var. *amoena* (A.C. Sm.) A.C. Sm. (1988) 58. — *Alyxia amoena* A.C. Sm. (1952) 115. — Type: *A.C. Smith 6375* (holo A; iso A, BISH, BRI, K, L, NY, P, S, US) from Fiji, Vanua Levu, Mathuata, Mt Numbuiloa, east of Lambasa.
- Alyxia latilimba* M.L. Grant, Fosberg & H.M. Sm. (1974) 50. — Type: *M.L. Grant 4964* (holo BISH; iso L, MIN (n.v.)) from Society Island, Borabora, Tevaitapu, Mt Tarapaia.
- Alyxia stellata* var. *deckeri* Fosberg & Sachet (1974) 254. — Type: *M.-H. Sachet & B.G. Decker 1151* (holo US; iso BISH, K, NY, P) from Marquesas, Hiva Oa, Atuona-Feani Trail, crest of ridge.
- Alyxia oliviformis* forma *ampla* H. St. John (1975) 380. — Type: *S. Carlquist 1659* (holo BISH) from Hawaii, Kauai, Napali, Hoolulu Valley, along Haena-Kalalau Trail.
- Alyxia oliviformis* forma *angustata* H. St. John (1975) 380. — Type: *J.F. Rock 27000* (holo BISH) from Hawaii, Maui, Auahi.
- Alyxia oliviformis* forma *cuneata* H. St. John (1975) 381. — Type: *G. Spence 44* (holo BISH; iso L, US) from Hawaii, Oahu, Waianae Mts, Honouliuli Forest Reserve, in gulch leading to Puu Hapapa.
- Alyxia oliviformis* forma *elliptica* H. St. John (1975) 381. — Type: *C.N. Forbes 2288b.M* (holo BISH; iso B, BO) from Hawaii, Maui, Olowalu Valley, lateral ridge.

- Alyxia oliviformis* forma *fusiformis* H. St. John (1975) 382. — Type: *C. N. Forbes & L. A. Thurston 1045.H* (holo BISH; iso MO, NY) from Hawaii, Hawaii Island, Puna.
- Alyxia oliviformis* forma *linearis* H. St. John (1975) 382. — Type: *H. St. John 20370* (holo BISH; iso A, G, K, UC, US) from Hawaii, Oahu, Koolau Range, Kaau-Waiomao Ridge.
- Alyxia oliviformis* forma *obovata* H. St. John (1975) 383. — Type: *C. N. Forbes 749.H* (holo BISH) from Hawaii, Hawaii Island, Kipuka.
- Alyxia oliviformis* forma *rotundata* H. St. John (1975) 384. — Type: *M. R. Crosby & W. R. Anderson 1567* (holo BISH; iso A, UC) from Hawaii, Oahu, Pupukea Trail.
- Alyxia oliviformis* forma *subacuta* H. St. John (1975) 384. — Type: *C. N. Forbes 940.H* (holo BISH) from Hawaii, Hawaii Island, Kiipu.
- Alyxia oliviformis* forma *retusa* H. St. John (1976) 388. — Type: *C. Christensen 61* (holo BISH) from Hawaii, Kauai, Napali, Hanakapiai.
- Alyxia fosbergii* J. Florence (1997) 27. — Type: *Florence, Chepstow-Lusty & Waldren 10893* (holo K; iso BISH, P, PAP, TER (n.v.), US) from Henderson Island.

Erect or arching shrubs to climbers, once reported as a treelet to 6 m high. *Branchlets* terete, weakly or strongly angled, densely lenticellate or not, glabrous to densely and minutely puberulent. *Leaves* opposite or in whorls of up to 5, most commonly opposite or in whorls of 3; subsessile or with petiole 5 cm long, glabrous; blade coriaceous to papery, linear, narrowly to broadly elliptic, ovate, obovate, or lanceolate, apex retuse to acuminate and then bluntly so or with a notch, not mucronate, base subcordate to decurrent onto petiole, margin flat to strongly inrolled and strongly undulate or not, 0.6–12.2 by 0.15–5 cm, 0.9–26 times as long as wide; midrib flattened or sunken, or raised and with a central groove above, intramarginal nerve obscure to clearly present and inset from or near margin, secondary veins 9–31 pairs, 55–80° from midrib, distinct to indistinct above, sometimes slightly sunken above, obscure to weakly prominent beneath, tertiary venation weakly prominent or flattened above, reticulate and parallel to secondary veins, or obscure; glabrous beneath and above. *Inflorescence* axillary or, rarely, terminal, a simple 2–6-flowered unbranched pleiochasium or with 1 or 2 internodes and unbranched side branches, fragrant, delicate, glabrous or, more rarely, sparsely to densely puberulent in upper parts or all over, 0.8–5 cm long; peduncle 0.1–12.5 by 0.5–1.2 mm, weakly flattened; bracts caducous or persistent, ovate, deltoid or lanceolate, 0.6–2 by 0.4–1.4 mm; bracteoles present, absent, or only on pedicel of terminal flower; pedicels (0–)2–23 mm long. *Sepals* linear, ovate, or lanceolate, apex rounded to acuminate, sometimes slightly reflexed, 0.8–3 by 0.5–2 mm, 0.5–2.9 times as long as wide, ciliate or not, glabrous to densely puberulent or puberulent on tips only outside, pubescent only at tips or glabrous inside, sometimes sepals of widely different sizes. *Corolla* white, cream, yellow, or orange or with tubes and lobes with various combinations of these colours; bud head 1.2–5.8 mm long, 0.26–0.5 of bud length, ellipsoid, lanceolate, ovate or deltoid, apex rounded to acuminate; tube columnar or slightly inflated, throat with or without thickening, 1.8–10.1 cm long, 0.8–2 mm wide, 1.5–6.6 times as long as sepals, 0.72–2.9 times as long as lobes, glabrous or, rarely, sparsely to densely pubescent around top of tube outside, inside generally pubescent around stamens and in a band beneath, sometimes slightly more extensively so and sometimes sparsely so and lacking the hairs around the stamens; lobes somewhat asymmetrically elliptic, ovate or orbicular, sometimes more strongly asymmetrically rhomboid with one side angled the other rounded or almost flat, or asymmetrically orbicular with one straight side and one strongly undulate side, apex rounded to acuminate, base auriculate,

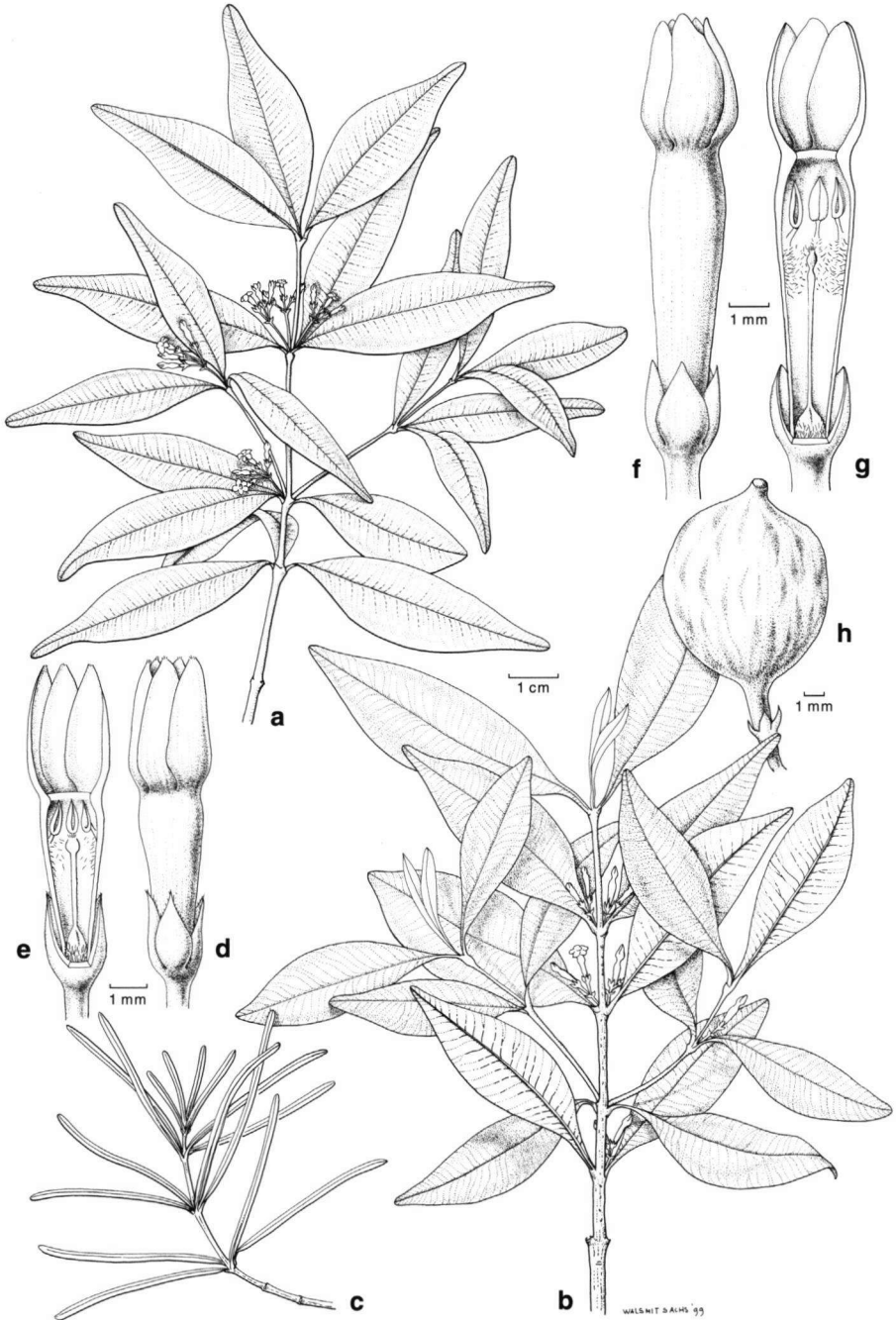


Fig. 4. *Alyxia stellata* (J.R. Forst. & G. Forst.) Roem. & Schult. a–c. Habit showing variation; d & f. flowers showing variation; e & g. flower dissections; h. fruit (a, f & g: *Sykes 169912*; b, d & e: *Van Balgooy 1687*; c: *Degener 15396*; h: *Fosberg 31337*).

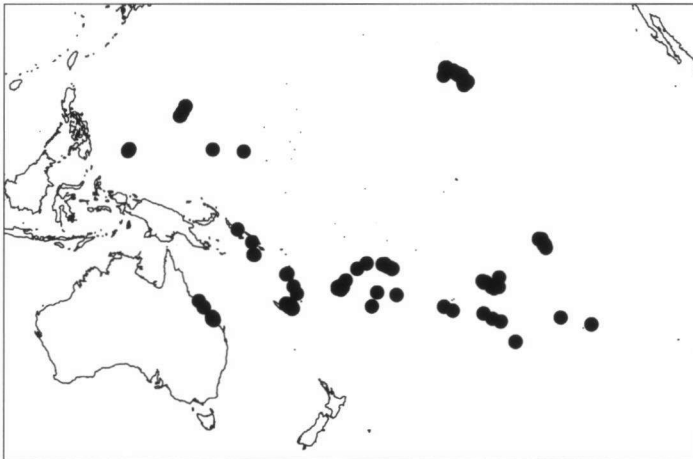
1.2–9.4 by 0.9–4.5 mm, 0.9–2.4 times as long as wide, glabrous or sparsely puberulent outside and glabrous inside, pubescent at base and/or tips of lobes inside, or pubescent on one side of lobe inside, not ciliate, ciliate or ciliate near tips only. *Stamens* inserted at 1.3–7.5 mm from corolla base which is 0.46–0.87 of tube length; anther apex 0–1.2 mm from corolla mouth, 0.6–1.4 by 0.3–0.6 mm, 1.75–3.5 times as long as wide, filament 0.2–0.7 mm long. *Ovary* 0.4–1 mm high, mostly pubescent in tuft between carpels, more rarely glabrous, sparsely pubescent all over or pubescent around base only, or in thick tufts between carpels covering 2 sides of the ovary with a space in-between; style 0.7–6.2 mm long; pistil head 0.3–1.4 mm long. *Fruit* black, purple or orange-brown; stalk 1.2–6.5 mm long; with 1–3 articles, c. 2.3 mm between articles; glabrous or sparsely puberulent at ends; articles with thin flesh, 6–27 by 5.7–14.5 mm, ellipsoid, globose or subglobose, symmetrical or asymmetrical, apex rounded to acuminate, or apiculate. *Seeds* ruminant, 5.1–15.3 by 3.9–10.9 by 3.1–11.6 mm. Embryo linear or with weakly undulate cotyledons, 4.7–12.5 mm long, 0.47–0.8 of embryo length.

Distribution — Widespread over the Pacific Islands from the Solomon Islands and the Caroline Islands in the west to Henderson Island in the east and Hawaii in the north to the Austral Islands in the south. It occurs primarily though on the wetter islands and is absent from the low atolls of Polynesia.

Habitat — In a wide range of habitats including both wet and dry forest types, secondary and primary forest, coastal forest, ridge forest, mossy forest and swamp forest and in various scrub types including maquis and coastal scrub and upper beaches. Reported from calcareous, basalt, limestone, clay and well-drained soils. At 0–2500 m altitude.

Vernacular names — Vono (Fiji), Lau maile (Samoa), Maile (Hawaii), Maire.

Nomenclatural issues — The typification of this species has been a complex affair. Grant et al. (1974) discussed *Alyxia* in the Society Islands and suggested that the Forster type was in the British Museum although noted that they had seen none of the



Map 28. Distribution of *Alyxia stellata* (J.R. Forst. & G. Forst.) Roem. & Schult.

specimens. The first attempt at formal typification was by Boiteau (1981) who called the Paris specimen a holotype. This is clearly a mistake as, at best, the Paris specimen could only be a lectotype. Smith (1988) suggested that the sheet indicated as coming from the Pallas Herbarium in the BM be the lectotype and only commented that Boiteau considered the Paris specimen to be the holotype. The situation seems to have been clarified by Fosberg (1993) who noted that the Paris specimen carried two pieces so that Boiteau's lectotypification was incomplete as he had not indicated which of the two pieces it was to be, although under Article 9.15 of the Saint Louis Code (Greuter et al., 2000) this must be considered a first step of a two stage lectotypification with Fosberg making the second step. Fosberg proceeded to designate the right hand piece as the lectotype and suggested this was in line with the description by Georg Forster (1786) which included the term 'lanceolatis' for the leaves. Unfortunately this right hand specimen is sterile, unlike the left hand specimen which has flowers, but the lectotypification is valid and there is little doubt that the right hand specimen is of *A. stellata*. What is not known, however, is where this specimen is from. Forster (1786) gave localities for this species as "Societatis et Amicorum insulae" which are the Society Islands and Tonga respectively. The right hand lanceolate-leaved specimen, the lectotype, could equally well be from either location. The left hand specimen is more than likely from Tonga because specimens with flowers as small have not been found in the Society Islands but are fairly common in Tonga. Further specimens possibly used to make the original description of both *A. stellata* and *A. scandens* are discussed in Fosberg (1993).

The validity, or otherwise, of Rechinger's *Gynopogon oliviformis* subsp. *apolimae* is a difficult issue. Under the heading of *Gynopogon oliviformis* he wrote: "*Subspec. *Gynopogon apolimae* Rechinger nov. subspec.", which, under article 33.1 of the International Code of Botanical Nomenclature (Greuter et al., 2000), almost certainly means that it is not validly published. However, the heading also refers to an illustration where the correct designation of *Gynopogon oliviformis* subsp. *apolimae* Rech. is given and, by reference back to the description given earlier, validates the name. It does not, however, deserve subspecific status and the validity of the name is not a pressing issue. It is interesting to note that Rechinger was the first to suggest that specimens from outside Hawaii were conspecific with the Hawaiian *A. oliviformis*.

St. John (1975) lectotypified *A. oliviformis* var. *myrtillifolia* A. Gray ex Hillebr. with Hillebrand (B) from West Maui, Waikapu. However, I have found no Hillebrand specimens in the Berlin Herbarium and it is likely that they were destroyed in World War II. Instead I have lectotypified the *Hillebrand & Lydgate 102* specimen from the same locality in the Bishop Museum which St. John designated an isotype (albeit without crediting the second collector or the collection number).

Fosberg wrote new names for innumerable varieties on the sheets of this species in BISH. Fortunately these were not published and these names are not reproduced here to avoid confusion.

Notes — In this revision I have chosen to synonymise a large number of taxa from the islands of the Pacific Ocean into *A. stellata*. Although entities on some islands may be recognised, across the Pacific as a whole there is a complex pattern of variation which defies, with currently available information, any overall geographical analysis to identify discernible discontinuities. The problem with which one is left is that the

broadly defined *A. stellata* is enormously variable and would appear to be badly in need of at least an infraspecific structure. I have not done this as it seems to me that this cannot be satisfactorily accomplished without further sources of data and further collections from some of the more poorly collected island groups such as the Cook Islands, Tuamotus, the Marquesas and maybe an attempt to see whether the species is indeed absent from such island groups as Kiribati, the Line Islands and the Marshall Islands. Several of these islands have been extensively surveyed (Mueller-Dombois & Fosberg, 1998) with no reports of any *Alyxia* species. Many of them are too dry, others are very small with an extremely depauperate vegetation and others have been extensively altered by human habitation. Additionally it has been suggested (Fosberg, 1993) that the growth form of the plants may be used to discern taxa. Unfortunately this is very frequently inadequately described on herbarium sheets, even when it is at all. A field based study, followed by transplant experiments, would seem essential before accepting or dismissing such claims.

Considerable confusion has reigned over the status of *A. scandens* in relation to *A. stellata*. The two taxa were originally separated by Forster & Forster (1775), under the generic synonym of *Gynopogon*. *Alyxia stellata* was said to have ternate leaves and *A. scandens* opposite leaves. Grant et al. (1974), in a work on the plants of the Society Islands, summarised much of the information available on the distinction between these two species and noted that distinguishing them on the basis of leaf arrangement was the prevailing method to separate the two taxa from Forster & Forster onwards despite the fact that some specimens actually present both arrangements on a single branch. A few authors did note in passing that the character could be variable within *A. stellata* (Rechinger, 1910; Christophersen, 1935). This character is variable in a number of other species of *Alyxia* such as *A. sinensis* and *A. reinwardtii*. Grant et al. preferred to separate the two species on the basis of leaf shape, *A. scandens* having broader leaves than *A. stellata* which they said had narrower lanceolate leaves. They suggested that flower size had very little value in distinguishing the two species but did note that there may be distinctions based on habit. The question is whether those large lianas with large leaves and often larger flowers formerly placed in *A. scandens* do indeed adopt a different growth form from the outset or whether they are just responding to the opportunities to climb and grow larger that their environment presents to them. The labels on several specimens suggest that the plant is a shrub but with the occasional longer sarmentose branch. In a note under their treatment of *A. scandens* they suggest that "these species are questionably distinct". Many intermediates exist in flower size and in leaf form. In the Marquesas the variety called *A. stellata* var. *maquesensis* provides a good example of intermediate plants in growth, leaf shape and size and flower size. There are also many intermediate specimens from Tahiti, where the largest flowers of the 'scandens' sort occur. Although the two species have been united in this study one could be forgiven for doubting very much that plants which are large lianas with large broad leaves and corolla tubes up to 1 cm long and plants which are small shrubs with small narrow leaves and corolla tubes only around 2 mm long could possibly belong to the same species. However, as one goes from the islands of the western Pacific across to the islands of the southern and northern central Pacific there is a continual change in a number of characters, particularly in corolla length which generally, but not exclusively, increases as one moves east. Leaf size and shape characters, although sometimes useful, have to be used with great care due

to the enormous amount of variation that may be found in some species and indeed even within single plants (compare also to *A. tisserantii* where leaf size and shape variation is even greater than that known in *A. stellata*). In terms of applying the name *A. stellata* to any of this enormous variation the places where the situation seems fairly clear are in Tonga and Fiji where the plants fit both of the specimens on the Forster sheet in Paris (of which one has been lectotypified) fairly closely. As one moves east across the Pacific one is confronted with gradually larger flowers and larger, broader leaves until one reaches the Society Islands where there is a mixture of plants with large leaves and large flowers and with smaller flowers and narrow leaves. Fosberg (1993) suggested that one could remove *A. scandens* from the *A. stellata/scandens* complex in the eastern Pacific by taking out all the plants with flowers well over 5 mm long and large opposite leaves. He then suggested this left two distinct entities, a narrow-leaved erect shrub and a broader-leaved twining plant. Basing the taxa on these characters is unsatisfactory for the reasons described above, notwithstanding the fact that specimens are known which cross over these characters. Whether the leaves are opposite or ternate is not at all a useful character as this can also be variable even within individuals. What is very clear is that the flowers from the western Pacific are, on the whole, much smaller than those in the eastern Pacific. The unsatisfactory solution proposed here, to synonymise all the taxa into one variable species, must be considered provisional until a detailed morphometric study coupled with field work. Lastly, any thorough examination of the patterns of variability in this group and any attempt to add infraspecific taxa would be greatly enhanced by the addition of molecular characters. One thing to bear in mind in this possible future work is that the plants are reported as having ceremonial and decorative use in a number of different parts of its range and the name for all the various synonyms from throughout the area populated by Polynesian people is either Maile or Maire and its widespread distribution may, at least in part, be due to spread by human agents.

Alyxia linearifolia from Fiji has been included in *A. stellata* on the grounds that it can only be distinguished by the leaf ratio rather than by any of the floral characters that Smith (1988) also suggested. Even in leaf ratio it is rather arbitrary where the cut off is made between those specimens of typical *A. stellata* which have rather narrow leaves and the rather broader leaved specimens of *A. stellata*. One collection, *Smith 4471*, shows the linear, parallel sided leaves of *A. linearifolia* and the narrower, non parallel sided, form of leaves frequently found in *A. stellata* and all on a single branch. As is noted elsewhere in this paper leaf shape can be extremely variable within species and, although the geographical range of this particular leaf variant of *A. stellata* is rather limited, the total variation in the species is still lower than has even been found within a single individual of something like *A. tisserantii* (*McKee 23658* has leaves 2.4–40 times as long as wide on the same plant). Smith (1988) maintained two varieties of *A. stellata* in Fiji and kept *A. linearifolia* as a separate species. *Alyxia stellata* var. *amoena* cannot be maintained as there is an enormous overlap in all the characters used to maintain the variety. Even within individual specimens there is a large overlap, especially in the leaf characters (e.g. *Smith 7437* which has a leaf ratio of 1–6 times as long as wide within a single specimen). I have seen no flowers in Fiji approaching the size of the larger range Smith gives for his var. *stellata*, instead the flowers of both varieties overlap entirely.

The inflorescences are almost always simple pleiochasia with 3 or 4 flowers. However, in a few Samoan specimens the terminal pedicel is again branched and bears 2 or 3 subsessile flowers. In others there are a few bracteoles where there could conceivably have been flowers formed. These specimens also have pubescent inflorescences. Although these differences appear quite marked, pubescent inflorescences without these extra flowers are also known and in all other vegetative, floral and fruiting characters there are no differences from typical *A. stellata*.

Forster (1992) and Middleton (2000) synonymised *A. obtusifolia* under *A. spicata*. However, I now believe it to be a synonym of *A. stellata*. Most material of *A. spicata* has subsessile flowers or at least flowers with very short pedicels. Also the inflorescences are generally densely pubescent (Forster reports that they may be glabrous but I have seen no specimens unequivocally belonging to *A. spicata* with a glabrous inflorescence) and the inflorescences are also never only simple pleiochasia without any internodes. The type material of *A. obtusifolia*, despite the fact that it is fruiting rather than flowering, clearly has distinctly pedicellate fruits, the infructescence is glabrous and it has simple pleiochasia. *Alyxia stellata* has not previously been reported from Australia except for the note that Forster made that *A. thozetii* was not conspecific with any Australian species but rather with *A. amoena* from Fiji which is now a synonym of *A. stellata*. He noted that there was no way of knowing for sure where the seed from which this plant was grown originated but dismissed the possibility it could be native by including it in the excluded species section. Although I agree that *A. thozetii* is a synonym of *A. stellata* this species does indeed appear to be native to Australia.

The following are recognisable entities which have, however, been synonymised within *A. stellata*:

Alyxia stellata forma *rapensis* from the Austral Islands (although curiously, considering the name, not from Rapa Island) is a form which appears very like specimens formerly placed in *A. scandens*.

Alyxia stellata forma *magnacarpa* — This entity is most clearly recognisable not by the large fruits which the name would imply but by its coriaceous leaves with revolute margins.

Alyxia torresiana — This entity from the northern Mariana Islands often has flowers with polymorphic sepals where the smaller sepals can be as little as half the size of the longer ones. Although there is a great overlap with *A. stellata* elsewhere in its range it tends to have sepals which are relatively long in comparison with the corolla tube. The corolla lobes also tend to be more acuminate than in most specimens of *A. stellata*. The pubescent inflorescences are somewhat reminiscent of *A. solomonensis*. It has a particularly swollen corolla throat resulting in a very narrow aperture and the corolla lobe margins are often strongly undulate.

Alyxia fosbergii — This is distinctive because of its 4 verticillate leaves as opposed to the opposite or ternate leaves of most specimens. All the material from Henderson Island shares this character. However, some specimens from Fiji have up to 5 leaves in a whorl. The flowers of *A. fosbergii* fall very easily within the range of variation of *A. stellata* with most similarity to the large flowered specimens from the Society Islands, Austral Islands and the Marquesas. The large fruits are also found in material from the Gambier Islands and the Austral Islands.

Alyxia oliviformis — The characters which could serve to maintain this taxon separately from *A. stellata* are the glabrous ovary and the small head to the corolla bud compared to the length of the corolla tube, reflected in the relatively short lobes when opened. These characters, however, are also found in *A. stellata*, albeit rarely, but in each case as part of a population which also includes the more common slightly pubescent ovary and larger bud heads. In Hawaii these characters are consistent despite the enormous variation in vegetative characters found in the species. The variation has been commented on by several authors (Hillebrand, 1888; Wagner et al., 1990; Mabberley, 1998) but most notably by St. John (1975) who created many infraspecific taxa. I have not maintained these as numerous intermediates can also be found and delimiting them becomes impossible. As in *A. stellata* in the rest of its range it would be interesting to see detailed work on the variation and ecology in the field and molecular work in the laboratory. This is perhaps the most distinctive group within *A. stellata* and when a clearer idea of the relationships of the plants across the Pacific is available will probably deserve subspecific or varietal status. It bears some similarities with plants from the Marquesas, particularly the group that was placed in *A. stellata* var. *deckeri*.

There are a number of specimens from Rennel and Bellona Islands in the southern Solomon Islands which have fruits which are fairly large and some of the flowers have lobes longer than the tube.

Alyxia stellata and *A. tisserantii* are both extremely variable species and the extremes of both could be confused. Boiteau (1981) suggested that *A. stellata* was found in both New Caledonia and the Loyalty Islands. The material from the Loyalty Islands is fairly typical *A. stellata* but the other material has small flowers and a general appearance more typical of *A. tisserantii* and I have chosen to include this material in that species. However, given the enormous variation of both species more work needs to be done to really clarify the specific limits here.

35. *Alyxia tetanifolia* Cranfield — Map 7

Alyxia tetanifolia Cranfield (1995) 103; P.I. Forst. (1996) 133. — Type: *R. Spencer K19* (holo PERTH; iso BRI, CANB) from Australia, Western Australia, near Kalgoorlie Nickel Smelter.

Erect shrubs, c. 2 m high. *Branchlets* weakly angled, not lenticellate, sparsely to densely and minutely puberulent. *Leaves* opposite or in whorls of 3; petiole 0.1–0.2 cm long, pubescent; blade coriaceous, linear, apex mucronate, base cuneate, margin strongly inrolled, 0.3–2.3 by 0.1–0.25 cm, 4–10 times as long as wide, midrib slightly sunken above, intramarginal nerve absent, secondary veins indistinct above, obscure beneath, tertiary venation obscure; sparsely puberulent all over beneath, puberulent all over above, not punctate beneath. *Inflorescence* terminal, flowers solitary, sparsely to densely puberulent, 1 cm long; bracts persistent, deltoid, c. 1 by 0.6 mm wide; pedicels c. 1 mm long. *Sepals* ovate, apex acuminate, c. 1.5 by 0.9 mm, 1.7 times as long as wide, ciliate, densely puberulent outside, glabrous inside. *Corolla* cream; bud head 1.9 mm long, 0.23 of bud length, ovate, apex acuminate; tube columnar, 6–6.5 mm long, 1.4–1.8 mm wide, 4.3 times as long as sepals, 3 times as long as lobes, glabrous or with a few hairs around top of tube outside, sparsely pubescent around stamens and more

densely in a band beneath them inside; lobes asymmetrically rhomboid with one side angled and the other rounded or almost flat, apex acute, 2–2.2 by 1.5–1.8 mm, 1.1–1.5 times as long as wide, glabrous or sparsely puberulent at base of lobes outside, glabrous inside, not ciliate. *Stamens* inserted at 5.4 mm from corolla base which is 0.79 of tube length; anther apex 0.2 mm from corolla mouth; anthers 1 by 0.6 mm, 1.7 times as long as wide; filament 0.4 mm long. *Ovary* 1 mm high, pubescent around base only; style 4 mm long; pistil head 0.8 mm long. *Fruit* stalk 1 mm long, with 1 article; articles with thin flesh, 4.7–5.7 by 4.4–5.2 mm, globose, symmetrical, apex rounded. *Seeds* ruminant, 4.5 by 3.3 by 3.2 mm.

Distribution — Australia (Western Australia).

Habitat — Chenopod shrubland and *Acacia* woodland, on brown sandy clay, stony red brown loam soil, moist brown/white concretionary gravel and red/brown loamy sand over granite.

Note — This species is part of the *A. ruscifolia* group although it is geographically quite separate from the other species.

36. *Alyxia tisserantii* Montrouz. — Fig. 5, Map 29

Alyxia tisserantii Montrouz. (1860) 233; Boiteau (1981) 118. — Holotype: *Montrouzier s.n.* from Ile Art, New Caledonia (not found). Neotype: *H.S. McKee 30500* (neo L; isoneo K, P) from New Caledonia, Ile Art.

Alyxia obovata Seem. (1866) 156. — Type: *W. Anderson s.n.* (holo BM) from New Caledonia, Isle of Pines.

Alyxia disphaerocarpa Van Heurck & Müll.Arg. (1870) 169; Däniker (1933) 381; Guillaumin (1948) 291. — *Pulassarium disphaerocarpum* (Van Heurck & Müll.Arg.) Kuntze (1891) 417. — Type: *E. Vieillard 951* (holo AWH [see note]; iso A, BR, G, K, L, NY, P, W, Z) from New Caledonia, Poupou, Ile Tanlé.

Alyxia affinis Van Heurck & Müll.Arg. (1871) 193; Guillaumin (1948) 292; Boiteau (1981) 114. — *Pulassarium affine* (Van Heurck & Müll.Arg.) Kuntze (1891) 417. — Type: *E. Vieillard 958* (holo AWH; iso BM, G, K, P) from New Caledonia, Gatope. The holotype is poor with a few leaves and fruits.

Alyxia breviflora Van Heurck & Müll.Arg. (1871) 195; Guillaumin (1948) 291; Boiteau (1981) 126. — *Pulassarium brevifolium* Kuntze (1891) 417, nom. inval. — Type: *E. Vieillard 952* (holo AWH; iso BM, G, K, P) from New Caledonia, Gatope.

Gynopogon microbuxus Baill. (1889a) 776. — *Alyxia microbuxus* (Baill.) Guillaumin [(1911) 194, combination not made] ex Däniker (1933) 383; Guillaumin (1941) 366; (1948) 292; Boiteau (1981) 123. — Type: *J.A.I. Pancher s.n.* (lecto P, designated by Boiteau (1981); iso A, K) from New Caledonia.

Gynopogon rosmarinifolius Baill. (1889b) 782. — *Alyxia rosmarinifolia* (Baill.) Guillaumin [(1911) 194, combination not made] (1941) 366; (1948) 292. — Type: *B. Balansa 2428* (lecto P, designated here; iso K) from New Caledonia, Canala.

Gynopogon celastrineus Baill. (1889b) 782. — *Alyxia celastrinea* (Baill.) Guillaumin (1941) 365; (1948) 292; Boiteau (1981) 140. — Type: *B. Balansa 2825* (lecto P, designated by Boiteau (1981), step 1, and here, step 2; iso P) from New Caledonia, Tamoia.

Alyxia diellipticocarpa Heckel ex L. Planch. (1894) 217; Guillaumin (1948) 292. — Type: Not known but the description clearly puts it in this species.

Gynopogon labillardieri K. Schum. (1895) 151. — Type: *Labillardière s.n.* (lecto P, designated here; iso BM, G-DC, L, P) from New Caledonia.

Alyxia myrtoides Schltr. (1906) 237; Guillaumin (1948) 291. — Type: *F.R.R. Schlechter 15133* (B (destroyed); lecto P, designated here; iso BM, BR, G, HBG, K, WRSL) from New Caledonia, Ngoye.

- Alyxia nummularia* S. Moore (1921) 358; Guillaumin (1948) 291; Boiteau (1981) 130. — Type: *R. H. Compton 841* (holo BM) from New Caledonia, Mt Dore.
- Alyxia spec.* S. Moore (1921) 359. — Based on *R. H. Compton 137* (BM, K).
- Alyxia* cf. *disphaerocarpa* Däniker (1933) 381. — Based on *A. U. Däniker 766* (L, P, Z).
- Alyxia* cf. *nummularia* Däniker (1933) 383. — Based on *A. U. Däniker 358* (Z).
- Alyxia spec.* Guillaumin (1957) 77. — *Alyxia spec. nov.* Guillaumin (1957) 81. — Based on *A. Guillaumin & M. G. Baumann-Bodenheim 9512A+B* (P).
- Alyxia doratophylla* Guillaumin (1957) 78. — Type: *H. Hürlimann 1129* (lecto P, designated here; isolecto Z) from New Caledonia, Mt Couvelée. Syntypes: *A. Guillaumin & M. G. Baumann-Bodenheim 6885* (A, NY, P, US, Z), *A. Guillaumin & M. G. Baumann-Bodenheim 12142* (P, Z).
- Alyxia spathulata* Guillaumin (1957) 80; Boiteau (1981) 120. — Type: *R. Germain s.n.* (lecto P, designated by Boiteau (1981); isolecto P) from New Caledonia, Ile des Pins. Syntype: *M. G. Baumann-Bodenheim 13689* (P, US, Z).
- Alyxia spec.* Guillaumin (1957) 80. — Based on *A. Guillaumin & M. G. Baumann-Bodenheim 9529* (P, Z).
- Alyxia* cf. *rosmarinifolia* Guillaumin (1957) 80. — Based on *A. Guillaumin & M. G. Baumann-Bodenheim 9630* (P, Z).
- Alyxia spec.* Guillaumin (1957) 81. — Based on *A. Guillaumin & M. G. Baumann-Bodenheim 6652* (NY, P, Z).
- Alyxia dolioliflora* Guillaumin (1958) 398; Boiteau (1981) 107. — Type: *C. MacMillan 5108* (holo P; iso A, BISH, E, K, L, UC) from New Caledonia, 2 miles south of Pouembout.
- Alyxia microcarpa* Pancher ex Boiteau & L. Allorge (1979) 449; Boiteau (1981) 121. — Type: *J.A.I. Pancher 308* (holo P; iso A, K, MEL, P, Z) from New Caledonia, near Nouméa.
- Alyxia pseudoserpentina* Boiteau & L. Allorge (1979) 448; Boiteau (1981) 116. — Type: *B. Balansa 221* (holo P; iso A, K, P, Z) from New Caledonia, near Nouméa. The K specimen is only tentatively an isotype as its details are not clear.
- Alyxia discolor* Boiteau & L. Allorge (1979) 449; Boiteau (1981) 131. — Type: *B. Balansa 3473* (holo P; iso A, P, Z) from New Caledonia, Dothio.
- Gynopogon stellatum* auct. non J.R. Forst. & G. Forst.: Labill. (1824) 30, t. 34.
- Alyxia stellata* auct. non (J.R. Forst. & G. Forst.) Roem. & Schult.: Montrouz. (1860) 232.

Erect shrubs, shrubs with arching stems, or climbers, 0.2–4 m high. Bark brown, red, grey or black. *Branchlets* terete to strongly angled, not to densely lenticellate, glabrous to densely puberulent. *Leaves* opposite or in whorls of 3 or 4; petiole 0.1–0.5 cm long, glabrous or pubescent; blade thickly coriaceous to papery, linear, narrowly to broadly elliptic, ovate, obovate or oblong, apex retuse to acuminate, sometimes acuminate and notched at the apex, not mucronate, base subcordate to decurrent onto petiole, margin flat or weakly to strongly inrolled, weakly undulate or not, 0.4–8.5 by 0.1–2.9 cm, 0.9–55 times as long as wide, midrib flattened, sunken, or raised and with a central groove above, intramarginal nerve distinct to absent, secondary veins 8–37 pairs, 30–70° from midrib, weakly prominent to obscure above, obscure or weakly visible beneath, tertiary venation weakly prominent to obscure above; glabrous to puberulent all over beneath and above. *Inflorescence* 1–5-flowered, axillary or (pseudo)terminal, most commonly a simple unbranched pleiochasium, sometimes of solitary flowers, with 1 or 2 internodes and unbranched side branches, delicate, glabrous to densely puberulent, 0.5–4.3 cm long; peduncle 0.1–1(–2.3) cm long, 0.4–0.7 mm wide, weakly flattened; bracts caducous or persistent, deltoid, 0.5–1.2 by 0.4–1.1 mm; bracteoles absent or only on pedicel of terminal flower, pedicels 0.4–4 mm long. *Sepals* ovate, apex obtuse to acuminate, apex slightly reflexed or not, 0.6–2.7 by 0.5–1.5 mm, 0.9–2.7 times as long as wide, ciliate or not, glabrous to densely puberulent, polymorphic or of similar sizes, glabrous, pubescent only at tips inside or pubescent over upper

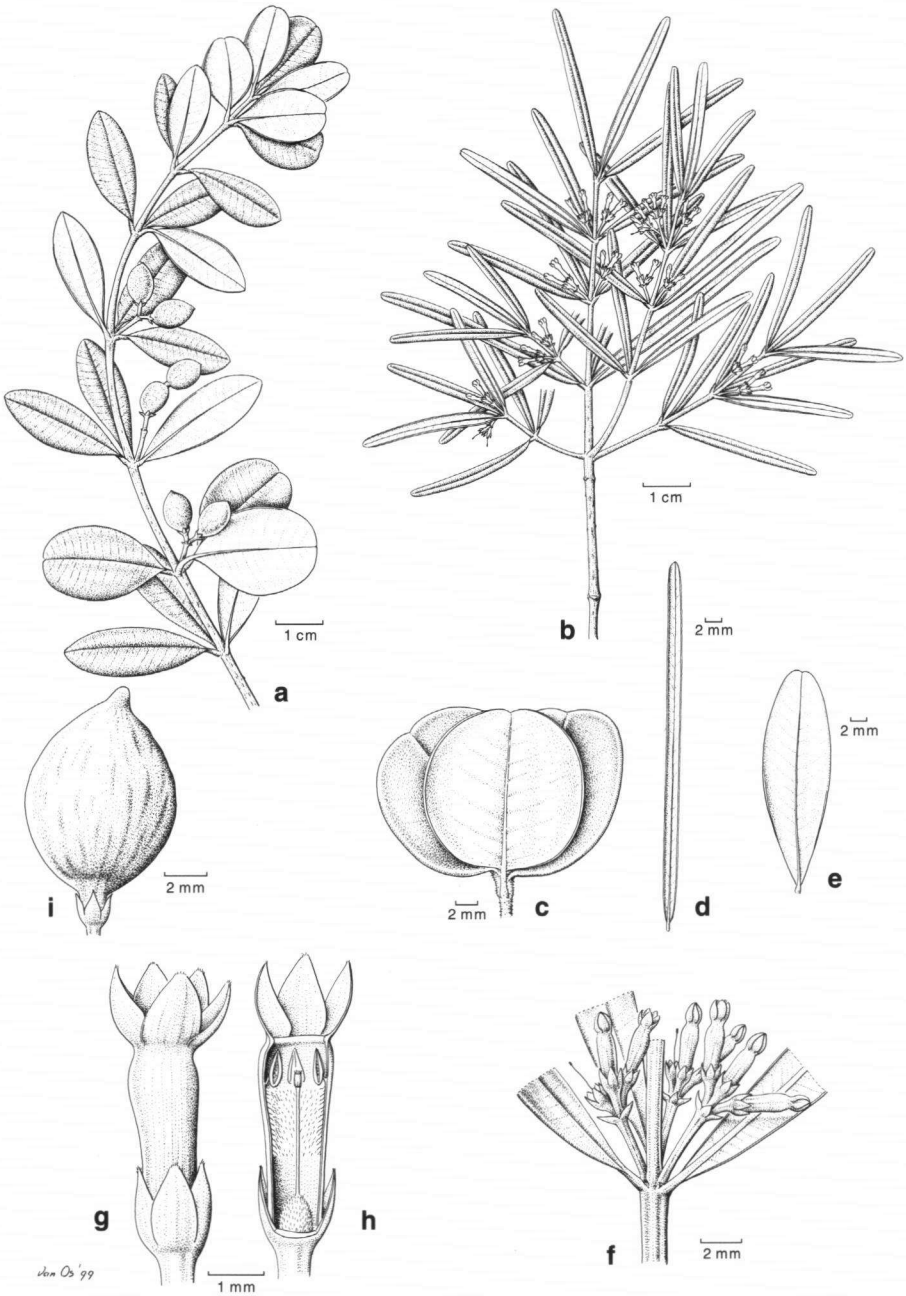


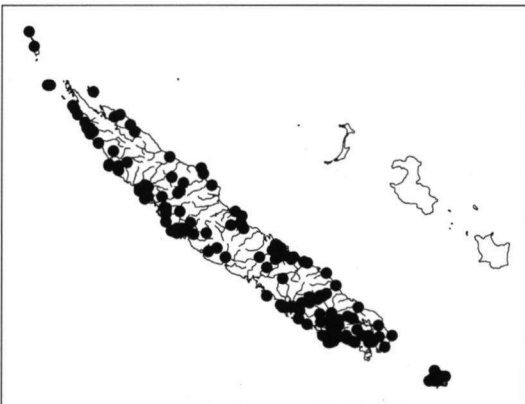
Fig. 5. *Alyxia tisserantii* Montrouz. a & b. Habit showing variation; c–e. leaf shape variation; f. inflorescence; g. flower; h. flower dissection; i. fruit (a & i: McKee 29753; b, f–h: McKee 30566; c: McKee 7736; d: Baumann-Bodenheim 13340; e: Veillon 3431).

half inside. *Corolla* white, yellow or with an orange or yellow tube and white lobes, not fleshy; bud head 0.6–2.2 mm long, 0.26–0.49 of bud length, globular or ovate, apex rounded to acuminate; tube columnar or slightly inflated, 1.6–3.8(–4) mm long, 0.7–1.4 mm wide, 1.2–5.9 times as long as sepals, 1.1–3.9 times as long as lobes, glabrous outside, pubescent in a band below the stamens or sparsely pubescent around stamens and more densely in a band beneath them inside; lobes elliptic, ovate, obovate, orbicular, or asymmetrically rhomboid with one side angled the other rounded or almost flat, apex rounded to acuminate, 0.8–2.7 by 0.8–2.7 mm, 0.75–1.8 times as long as wide, glabrous outside, inside glabrous or pubescent at tips of lobes, not ciliate or ciliate near tips only. *Stamens* inserted at 1–3.9 mm from corolla base which is 0.5–0.76 of tube length; anther apex 0–0.6 mm from corolla mouth; anthers 0.6–0.9 by 0.2–0.4 mm, 2–4 times as long as wide; filament 0.2–0.4 mm long. *Ovary* 0.3–1.3 mm high, densely pubescent all over, pubescent around base only, pubescent in tuft between carpels, or in thick tuft between carpels covering 2 sides of the ovary with a space in-between; style 0.4–2.7 mm long; pistil head 0.2–0.5 mm long. *Fruit* black or green, stalk 1–4 mm long, with 1–5 articles, 0.5–2 mm between articles, glabrous or sparsely puberulent at ends, 3.5–14.5 by 3.4–9 mm, ellipsoid or subglobose, symmetrical, apex rounded. *Seeds* elliptic, ruminant, 3–8.3 by 2.6–5 by 2.6–4.9 mm.

Distribution — New Caledonia.

Habitat — In a wide range of forest types and in scrub and maquis on serpentine, calcareous and sedimentary soils at 0–1000 m altitude.

Typification — This species was first described by Montrouzier (1860) based on a collection of his from Ile Art off the northern coast of New Caledonia. No Montrouzier specimens have been found in Lyon or Montpellier and the solitary specimen collected by him on Ile Art in the Paris Herbarium corresponds more to the description Montrouzier gives for his concept of *A. stellata* (Montrouzier, 1860: 232), except for the rather small leaves, than it does for his description of *A. tisserantii*. In Geneva there are two Montrouzier specimens: one is a specimen of *A. loesneriana* and fits neither description for the *Alyxia* taxa he gives and the other is a duplicate of the Paris specimen. It would appear that there is no surviving type material of *A. tisserantii*, hence the need for a neotype.



Map 29. Distribution of *Alyxia tisserantii* Montrouz.

The type of *A. disphaerocarpa* in AWH has two collections on it. The holotype is probably only the lower left hand specimen of the four pieces on the sheet. The other three pieces are *Veillard 2968*.

Notes — *Alyxia tisserantii* is perhaps the most variable species of *Alyxia* in its leaf shape and size although it is not particularly variable in its flowers. It is close to *A. stellata* and not always easily separated from that species for those specimens of *A. tisserantii* with broader, acuminate leaves previously assigned to *A. affinis* and to *A. brevipes* from mainland New Caledonia and the Isle des Pins. Particularly on the Isle des Pins several specimens approach *A. stellata* and future research may prove that the limits of the two species need to be reassessed. Boiteau (1981) assigned this material to *A. stellata* but I have chosen to limit *A. stellata* in New Caledonia only to the Loyalty Islands. Given the widespread nature of *A. stellata* in the Pacific and that it reaches Australia to the west of the New Caledonian mainland there is a chance that this species does also occur on the New Caledonian mainland. The species shows an enormous variation in leaf shape from very narrowly elliptic opposite leaves, and with the venation more or less obscure adaxially, to obovate ternate leaves with a retuse apex and with prominent abaxial venation. This variation can even be found within a single plant. *Veillon 8057* shows leaves with a ratio of 1.5–11.3 times as long as wide. The leaves are small and ovate to long and linear and opposite, 3- or 4-verticillate. The same specimen is also only sparsely pubescent on the branches with narrow leaves and densely pubescent on those with broader leaves. *Sévenet & Boiteau 1116* has leaves from 1.3–16.5 times as long as wide and *Veillon 8001* has them 1.1–13 times as long as wide, and these both on fairly small shrubs. *Viro 1177* shows completely glabrous young forms and densely pubescent older ones and leaves with a ratio of 0.9–10.4. The collection *Stauffer 5719* has branches with linear leaves, and notes that indicate that this is the non-lianoid youth form, plus older branches with broadly elliptic leaves.

The characters which were used to distinguish *A. doratophylla* were due to the flowers being parasitised.

McKee 25720 has quite complex inflorescences with small terminal pleiochasia but is otherwise unremarkable for this species.

One of the specimens labelled *Franc 759* is of *A. tisserantii* growing in the Loyalty Islands. This may be a mistake.

Alyxia labillardieri was published by Schumann as a new name for Labillardier's concept of *A. stellata* from New Caledonia. This name was not mentioned by Boiteau. It falls clearly within the variation of *A. tisserantii*.

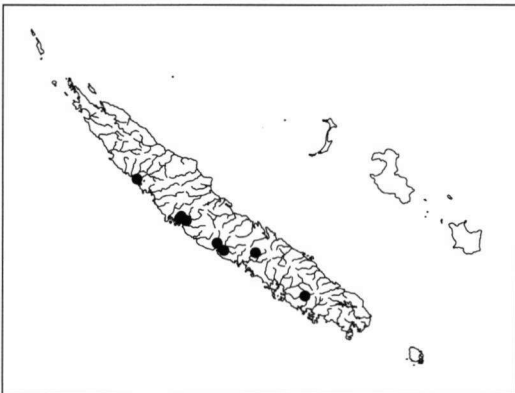
The name *A. obovata* Seem. carries with it some nomenclatural problems. It was first published by Seemann in his *Flora Vitiensis* in 1866 as a note where he listed species of the genus found in the Pacific other than in Fiji. In the protologue it quite clearly states that *A. obovata* is a new species based on a collection of W. Anderson from the Isle of Pines off New Caledonia. It is probably the association with this work on Fiji which has, however, caused this name to be neglected. Schlechter (1906) named an unrelated species of *Alyxia* with the same specific epithet unaware that his was a later homonym. Boiteau & Allorge (1979) referred this later species to the name *A. oubatchensis* (Schltr.) Guillaumin noting that Schlechter's *A. obovata* var. *oubatchensis* was merely a synonym of the species but that the specific name could not be

used. However, Boiteau & Allorge suggested that *A. obovata* Seem. was a species from Fiji and was not found in New Caledonia, a statement clearly in conflict with the protologue.

37. *Alyxia torqueata* (Baill.) Guillaumin — Map 30

Alyxia torqueata (Baill.) Guillaumin (1912) 166; (1948) 292; Boiteau (1981) 127. — *Gynopogon torqueatus* Baill. (1889b) 781. — Type: *B. Balansa 1398* (lecto P, designated by Boiteau (1981), step 1, and here, step 2; iso P) from New Caledonia, Bourail.

Climbers or shrubs with arching stems. *Branchlets* terete or weakly angled, not to sparsely lenticellate, glabrous. *Leaves* in whorls of 3; petiole 0.1–0.2 cm long, glabrous; blade papery, elliptic, apex rounded to short blunt acuminate, not mucronate, base cuneate, weakly undulate, 1.5–8.5 by 0.7–3.1 cm, 1.4–4.2 times as long as wide, midrib flattened or raised and with a central groove above, intramarginal nerve distinct at margin or absent, secondary veins 15–24 pairs, 60° from midrib, weakly prominent or indistinct above, obscure beneath, tertiary venation weakly prominent or flattened above, parallel to secondary veins; glabrous beneath and above, not punctate beneath. *Inflorescence* 3- or 4-flowered, axillary, a simple unbranched pleiochasium, delicate, glabrous, 2–3 cm long; peduncle 1.1–3.1 cm long, 0.4–0.5 mm wide, weakly flattened; bracts caducous or persistent, deltoid, 0.7 by 0.6 mm; bracteoles absent; pedicels 1.2–4 mm long. *Sepals* ovate, apex acute, 1.2–1.3 by 0.9–1 mm, 1.2–1.4 times as long as wide, ciliate or not, glabrous outside and inside. *Corolla* bud head 1.2–1.9 mm long, 0.36–0.39 of bud length, ovate, apex obtuse to acute, throat with thickening; tube 2.2–2.5 mm long, 1.2–1.3 mm wide, 1.8–1.9 times as long as sepals, 1.7–2 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes orbicular, apex rounded, 1.1–1.5 by 1.3–1.4 mm, 0.8–1.1 times as long as wide, glabrous outside and inside, not ciliate. *Stamens* inserted at 1.2 mm from corolla base which is 0.6 of tube length; anther apex at corolla mouth; anthers 0.6 by 0.3 mm, 2 times as long as wide; filament 0.3 mm long. *Ovary* 0.5 mm high, pubescent around base only; style 0.6 mm long; pistil head 0.2 mm long. *Fruit* black, stalk 2.1–2.4 mm long, with 1–3 articles, 1.5–2.3 mm between articles, glabrous; articles with thin flesh, 5.2–6 by 5.6–6.2 mm, globose, symmetrical, apex rounded. *Seeds* ovoid, ruminant, 2.3 by 2.5 by 3 mm.



Map 30. Distribution of *Alyxia torqueata* (Baill.) Guillaumin.

Distribution — New Caledonia.

Habitat — In forest on serpentine or alluvial soils at 40–450 m altitude.

38. *Alyxia tropica* (P.I. Forst.) D.J. Middleton, *comb. nov.* — Map 18

Alyxia ruscifolia subsp. *tropica* P.I. Forst. (1992) 557; (1996) 128. — Type: *G. Wightman & L.A. Craven 1443* (holo DNA; iso BRI, CANB, MEL) from Australia, Northern Territories, Headwaters of Liverpool River.

Erect shrubs, 1–3 m high. *Branchlets* weakly angled, sparsely lenticellate, sparsely to densely puberulent, or glabrescent. *Leaves* in whorls of 3–5; petiole 0.1–1.5 cm long, pubescent; blade coriaceous, narrowly elliptic to ovate, apex long sharp acuminate, mucronate, base acute or cuneate, margin weakly to strongly inrolled or flat, weakly undulate or not, blade 0.8–4.3 by 0.25–1.5 cm, 1.6–6.2 times as long as wide, midrib flattened or slightly sunken above, intramarginal nerve absent, secondary veins 8–16 pairs, 20–45° from midrib, distinct to indistinct above, obscure or weakly visible beneath, tertiary venation weakly prominent to obscure above, reticulate and parallel to secondary veins; sparsely puberulent all over beneath, puberulent all over above or with a few hairs along the margin. *Inflorescence* of solitary flowers or a 1–4-flowered, sessile, simple unbranched pleiochasium, axillary, terminal or pseudoaxillary, delicate, sparsely to densely puberulent all over, 1–2 cm long; peduncle 0–1 cm long, 0.8 mm wide, more or less terete; bracts persistent, ovate, linear or lanceolate, 1.9–3 by 0.7–1.4 mm. *Sepals* lanceolate, apex acute to acuminate, 2.6–4.2 by 1–1.6 mm, 1–2.8 times as long as wide, ciliate, densely puberulent outside, pubescent over upper half inside. *Corolla* white, not fleshy, fragrant; bud head 5.7–6.5 mm long, 0.39–0.42 of bud length, lanceolate, apex acuminate; tube columnar, throat with thickening, 6.1–11.6 by 1.3–1.7 mm, 2.25–3.5 times as long as sepals, 1.4–2 times as long as lobes, sparsely to densely puberulent all over outside, inside sparsely pubescent around stamens and more densely in a band beneath them or pubescent around and below anthers and in throat inside with a glabrous gap between; lobes elliptic, apex obtuse to acuminate, 3.1–7 by 1.4–3.5 mm, 1.9–3.5 times as long as wide, sparsely to densely puberulent outside, glabrous or pubescent at base of lobes inside, ciliate or not. *Stamens* inserted at 3.8–4.9 mm from corolla base which is 0.39–0.52 of tube length; anther apex 2.1–4 mm from corolla mouth; anthers 1.2–1.6 by 0.4–0.6 mm, 2.3–3.75 times as long as wide; filament 0.4–0.5 mm long. *Ovary* 0.7–0.9 mm high, densely pubescent all over; style 2.6–3.4 mm long; pistil head 0.5–0.8 mm long. *Fruit* red, orange, or orange-brown, stalk 1.5–2 mm long, with 1 or 2 articles, 0.5–3 mm between articles, glabrous, sparsely puberulent at ends or sparsely puberulent all over; articles with thin flesh, 6.8–11 by 5.1–10 mm, globose or subglobose, symmetrical, apex rounded. *Seeds* ovoid, ruminant, 6.4–8.4 by 4.7–5.3 by 4.4–4.9 mm.

Distribution — Australia (Northern Territories).

Note — This taxon was originally described as a subspecies of *A. ruscifolia* (Forster, 1992) and was noted as occurring in the Northern Territories and in Papua New Guinea. The specimens from New Guinea and others from the Moluccas were included in *A. oblongata* in Part 1 of this revision (Middleton, 2000). The sepals of these specimens from Malesia and typical *A. oblongata* from Australia are shorter than in *A. tropica* and the outside of the corolla tube is glabrous. This leaves the species *A. tropica* con-

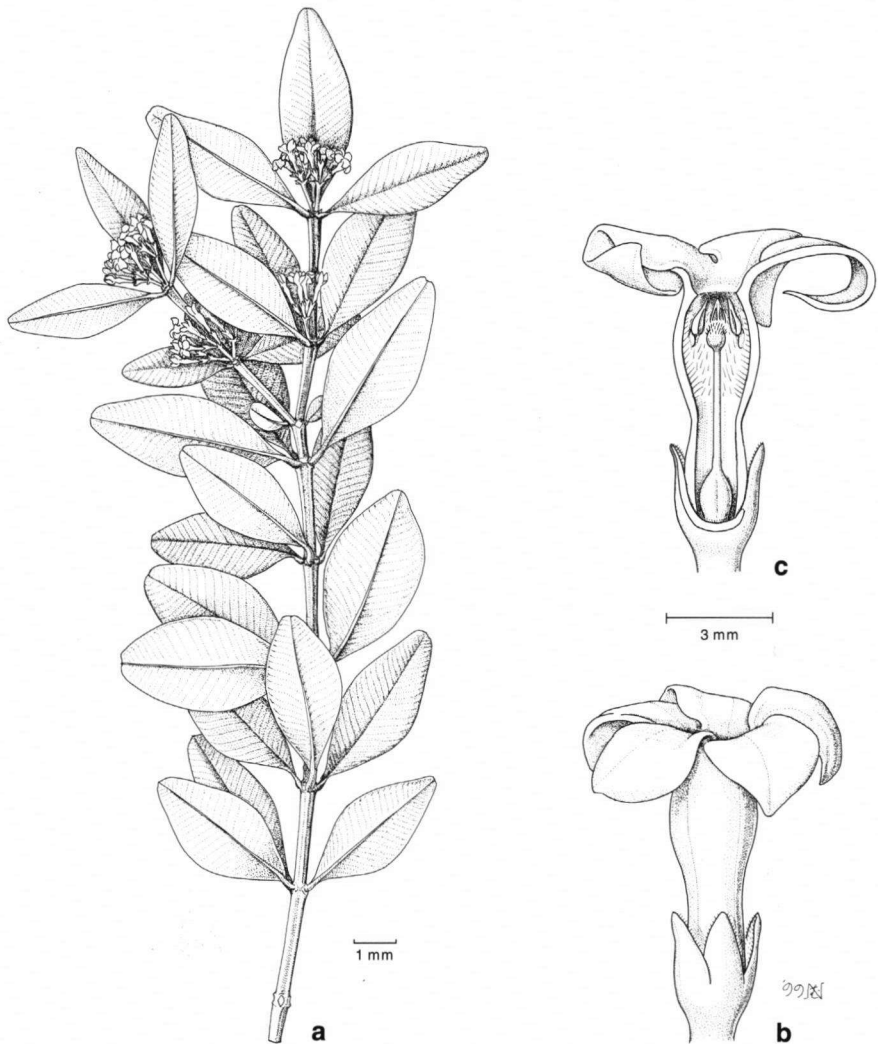


Fig. 6. *Alyxia veillonii* D.J. Middleton. a. Habit; b. flower; c. flower dissection.

found to the Northern Territories as delimited here. It is the most distinctive of the taxa in the *A. ruscifolia* group due mainly to the dense pubescence on the outside of the corolla tube but also due to the long sepals. Further discussion can be found under *A. ruscifolia*.

39. *Alyxia veillonii* D.J. Middleton, *spec. nov.* — Fig. 6, Map 17

Frutex erectus. Folia ternata coriacea elliptica apice truncato vel acuminato. Inflorescentiae axillares robustae 4–5-florae 1.6–2 cm longae glabrae. Corolla tubo circa 6.7 mm longo lobis circa 4.3 mm longis. Ovarium pubescens inter carpella fasciculis positus. — Typus: *J.M. Veillon 7783* (holo P) from New Caledonia, Tontouta.

Erect shrubs, recorded to 3 m high. *Branchlets* strongly angled, sparsely lenticellate, glabrous. *Leaves* in whorls of 3; petiole 0.3–0.4 cm long, glabrous; blade coriaceous, elliptic, apex truncate to short blunt acuminate, not mucronate, base acute or cuneate, margin flat, not undulate, 3–5.3 by 0.9–2.4 cm, 1.8–3 times as long as wide, midrib slightly sunken above, intramarginal nerve distinct at margin, secondary veins 24–30 pairs, 60–65° from midrib, weakly prominent above, weakly visible beneath, tertiary venation weakly prominent to obscure above, parallel to secondary veins; glabrous beneath and above, not punctate beneath. *Inflorescence* 4- or 5-flowered, axillary, a simple unbranched pleiochasium, robust, glabrous, 1.6–2 cm long; peduncle 0.4–0.7 cm long, 1.2 mm wide, weakly flattened; bracts persistent, deltoid, 1.3–1.7 by 0.9–1 mm; bracteoles absent; pedicels 2–3.5 mm long. *Sepals* ovate, apex acute, 1.7 by 1 mm, 1.7 times as long as wide, ciliate, glabrous, pubescent only at tips inside. *Corolla* bud head 3.5 mm long, 0.37 of bud length, lanceolate, apex acute or acuminate; tube columnar, throat with thickening, 6.7 mm long, 1.7 mm wide, 3.9 times as long as sepals, 1.6 times as long as lobes, glabrous outside, sparsely pubescent around stamens and more densely in a band beneath them inside; lobes ovate, apex acute, 4.3 by 2.5 mm, 1.7 times as long as wide, glabrous outside, pubescent at tips of lobes inside, ciliate near tips only. *Stamens* inserted at 4.6 mm from corolla base which is 0.7 of tube length; anther apex 0.6 mm from corolla mouth; anthers 1.1 by 0.5 mm, 2.2 times as long as wide; filament 0.5 mm long. *Ovary* 1.2 mm high, pubescent in tuft between carpels; style 3.4 mm long; pistil head 0.6 mm long. *Fruit* unknown.

Habitat — Maquis, on ultramafic soil, at 50–150 m altitude.

Note — This new species is quite distinct. Its affinities would appear to be with *A. glaucophylla* and *A. tisserantii* but the flowers are very much larger and more robust than in those species. There are only two known collections of this species: *Veillon 7783* and *McKee 4114*, both of them from Tontouta Valley in New Caledonia.

INSUFFICIENTLY KNOWN AND EXCLUDED TAXA

A list for the entire genus was provided in Middleton (2000).

A CORRECTION

In Part 1 of the revision of *Alyxia* (Middleton, 2000) I initially thought that *A. obovatifolia* Merr. was a synonym of *A. ganophylla* Markgr. but subsequently intended to remove it from my provisional synonymy and maintain it as a separate species, albeit known only from the type specimen. However, to my embarrassment I left the species in the list of synonyms for *A. ganophylla* and consequently omitted it from the key and from the text. Quite apart from the omission of a species it appears that the wrong name for *A. ganophylla* has been used due to the inclusion in synonymy of the older name *A. obovatifolia*. Fortunately the description given of *A. ganophylla* in Part 1 does not include the characteristics of *A. obovatifolia* which differs in having only one or two flowers in an inflorescence and having a slightly longer corolla tube. The account of the Apocynaceae for Flora Malesiana, which is in preparation, will contain a corrected key. In the meantime a description of *A. obovatifolia* is given here.

***Alyxia obovatifolia* Merr.**

Alyxia obovatifolia Merr. (1921) 306; (1923) 328. — Type: *Ramos & Pascasio 34492* (lecto K, designated here) from the Philippines, Mindanao, Surigao.

Branchlets weakly angled, not lenticellate, sparsely and minutely puberulent. *Leaves* in whorls of 4; petiole 0.4–0.7 cm long, pubescent; blade coriaceous, spatulate, apex rounded, not mucronate, base cuneate or decurrent onto petiole, margin strongly inrolled, not undulate, dark green, shining above, pale green beneath, 2.3–4.7 by 1.5–2.1 cm, 1.5–2.8 times as long as wide, midrib deeply sunken above, intramarginal nerve absent, secondary veins indistinct above and beneath, tertiary venation obscure; puberulent all over above and beneath. *Inflorescence* axillary, flowers solitary or a simple 2-flowered unbranched pleiochasium, densely puberulent, 1.5 cm long; when cymose subsessile; bracteoles present; pedicels 0.5 mm long. *Sepals* lanceolate, apex acute, c. 2.3 by 1.4 mm, 1.4–1.6 times as long as wide, ciliate, densely puberulent outside, pubescent only at tips inside. *Corolla* bud head 2.6 mm long which is 0.23 of bud length, ovate, apex obtuse; tube columnar, throat with thickening, 9 mm long, 1.4 mm wide, 3.9 times as long as sepals, 3.75 times as long as lobes, sparsely puberulent around top of tube outside, sparsely pubescent inside; lobes elliptic, apex obtuse, 2.4 by 1.5 mm, 1.6 times as long as wide, sparsely puberulent outside, glabrous inside, ciliate. *Stamens* inserted at 7.5 mm from corolla base which is 0.78 of tube length; anther apex 0.5 mm from corolla mouth; anthers 1.1 by 0.4 mm, 2.75 times as long as wide; filament 0.8 mm long. *Ovary* 1 mm high, densely pubescent all over; style 6.9 mm long; pistil head 0.6 mm long. *Fruit* unknown.

Distribution — The Philippines (Mindanao).

Note — This species is known only from the type specimen.

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An index is given for the entire genus, including the taxa from Part 1 of this revision (Middleton, 2000). For taxa which are a synonym of a genus and for species which are not now included in *Alyxia* the current name is given in brackets after the epithet. For other taxa the number before the colon refers to whether that taxon is discussed in Part 1 of this revision or in this paper, Part 2. The number after the colon refers to the number of the recognised taxon under which the name can be found. Taxa in roman script are currently recognised; taxa in *italic* script are synonyms and taxa in **bold** script are new taxa, names or combinations made in this paper. Misapplied names are not included in this index to avoid confusion and the overall length. This problem was much more acute in Asia and they have been given for those taxa in Part 1. Further information on the insufficiently known and excluded species can be found in Middleton (2000).

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Alyxia R.Br.

sect. *Gynopogon* (J.R. Forst. & G. Forst.)

Pichon (*Alyxia*)

sect. *Monospermae* Tsiang & P.T. Li (*Alyxia*)

(*Alyxia*)

sect. *Pteralyxia* (K. Schum.) Pichon

(*Pteralyxia*)

ser. *Alyxia* (*Alyxia*)

ser. *Baillonianae* Boiteau (*Alyxia*)

(Alyxia)

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