

## A systematic study of *Acacia calamifolia* s.l., with special emphasis on *A. euthycarpa* in Victoria

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### Abstract

Taxonomic revision of the *Acacia calamifolia* Sweet ex Lindl. complex shows that *A. euthycarpa* (J.M.Black) J.M.Black is distinct, and that the two species have allopatric distributions. Typical *A. calamifolia* has moniliform legumes, narrowly linear phyllodes, united sepals, and an elongated funicle half-encircling the seed. It occurs in New South Wales, and in the Flinders Ranges and North Mount Lofty Ranges of South Australia. *Acacia euthycarpa* has linear legumes, narrowly linear to oblanceolate phyllodes, free to united sepals, and a longer funicle that entirely or nearly entirely encircles the seed. It occurs in Victoria, on the Eyre Peninsula, Kangaroo Island, South Mount Lofty Ranges, and the Murray Lands of South Australia. Multigroup discriminant function analysis of *A. euthycarpa* using phyllode characters resolved two subspecies. *Acacia euthycarpa* subsp. *euthycarpa* has narrowly linear phyllodes. *Acacia euthycarpa* subsp. *oblanceolata* Stephen H. Wright, is newly described to accommodate populations from only two localities in Victoria and three in South Australia which have narrowly oblanceolate to oblanceolate phyllodes. A key to distinguish the new subspecies and the morphologically similar taxa is presented.

### Introduction

*Acacia calamifolia* Sweet ex Lindl., as currently understood, has a disjunct distribution throughout much of south-eastern Australian in semi-arid regions with a mean annual rainfall of 150–550 mm. It occurs on a range of soils in open scrub or woodland/open woodland communities and on rocky outcrops. *Acacia calamifolia* s.l. is generally a rounded to Y-shaped, multistemmed shrub 2–4 m high, but occasionally grows to a small, single-stemmed tree to 10 m high in parts of west-central Victoria. It generally has narrow phyllodes 1–5 mm wide, with four main veins (one main vein per face) and a distinctive, curved tip. It has legumes that are linear to moniliform, and an elongated funicle that half to entirely encircles the seed.

*Acacia calamifolia* var. *euthycarpa* J.M.Black (Black 1923) was distinguished from *A. calamifolia* var. *calamifolia* by its linear legume. Later, when elevating the taxon in rank to *A. euthycarpa* (J.M.Black) J.M.Black, Black (1945) again made the comparison in shape of the legume, but added that the phyllode of *A. euthycarpa* had three nerves. In spite of these differences, the name has long been considered synonymous with *A. calamifolia* (e.g. Whibley 1986; Entwisle *et al.* 1996; Maslin 2001). The complex that includes *A. calamifolia* and *A. euthycarpa* has been considered extremely variable (Whibley 1986; Entwisle *et al.* 1996).

A variant of *A. calamifolia* with broad, oblanceolate phyllodes occurs from South Australia to west-central Victoria (Willis 1972; Entwisle *et al.* 1996). This variant differs from typical *A. calamifolia* not only in size and shape of phyllodes, but also by habit, often becoming a substantial tree to 10 m, and with a funicle almost entirely encircling the seed (Willis 1972). These populations have often been erroneously known as *A. microcarpa* F.Muell. var. *linearis* J.M.Black (e.g. Whibley 1986).

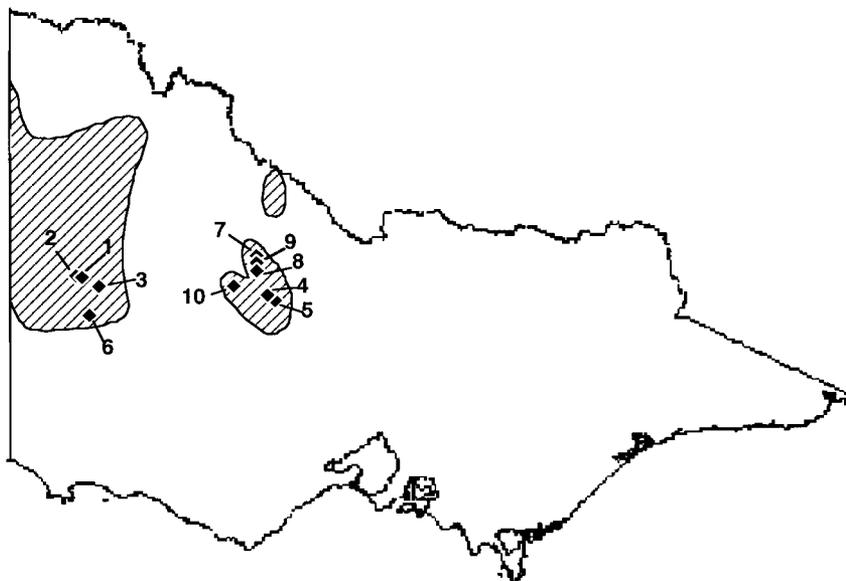
A taxonomic revision of *A. calamifolia* s.l. is given in the following. A morphometric analysis of phyllodes clarifies the taxonomy of broad and narrow phyllode forms in Victoria and South Australia, and supports the recognition of two distinct species, as well as a new subspecies of *A. euthycarpa*.

## Methods

Ten populations were sampled in the field for a multivariate analysis of phyllode characters, which are the most variable features of these populations. Legumes and seeds were not available for a quantitative comparison of populations, but were described from both field observations and from herbarium material. Originally flower characters were also measured, but not completed, as they exhibit almost no variation in size. Differences in fruit size were not measured for lack of adequate sample size. Field sampling was restricted to Victoria because nearly all of the variation in phyllode characters was represented in populations from that State. Four populations were sampled from the Wimmera and six from west-central Victoria (Fig. 1). Twenty individuals were sampled across the range of each population, subjectively from small populations (less than  $\pm 50$  individuals) and along a walk-transect for larger populations.

One typical mature phyllode was selected from each pressed specimen. Only one phyllode per individual was measured since measuring more phyllodes per individual was found to give no better estimate of plant population means (for those characters included in the analysis) and no less variances. The following phyllode meristic characters were scored: total length, length of pulvinus, width at widest point, and thickness at widest point. Vein number was noted for each population.

Multigroup discriminant function analysis (MDA) was chosen to analyse the phyllode characters because it is useful for comparing variability within and between populations. This analysis uses weighted predictor variables (i.e., weighted phyllode characters), in the form of linear functions, to provide the best discrimination between predetermined groups, in this case plant populations (Tabachnick & Fidell 1989). Each individual phyllode within a group obtains a discriminant value for each function based on its values for predictor variables. Individuals may be classified into populations using probabilities based on the dis-



**Figure 1.** Distribution of *A. calamifolia* s.l. in Victoria, with populations sampled for morphometric analysis numbered 1–10.

criminant scores. The analysis also infers the relative contributions of each predictor variable to the classification. Variables were transformed, when appropriate, to meet the assumptions of multivariate normality and equality of variance-covariance matrices.

Following analysis of the wild populations, phyllodes measured from herbarium specimens at MEL were classified by the MDA to determine their relationship with the populations of phyllodes sampled in the field. All statistical methods were performed on a PC computer using the SPSS Windows package (S.P.S.S. 1990).

## Results

Two discrete groups were separated by the first discriminant function in the MDA (Fig. 2), which accounted for 96% of the between-population variation in phyllode characters. The transformed variable log (width) was highly correlated (0.80) with this first function, inferring that width was the dominant character for separating populations (Table 1). Of the two groups separated, one had narrow phyllodes, averaging 1.1 mm wide (population 1–8), and the other had broad phyllodes, averaging 3.3 mm wide (populations 9–10 from Wychitella and Yowang Hill, respectively, in west-central Victoria). The means for the untransformed phyllode characters in the narrow and broad groups are shown in Table 2.

**Table 1.** Correlation between phyllode variables and the first two discriminant functions of the MDA.

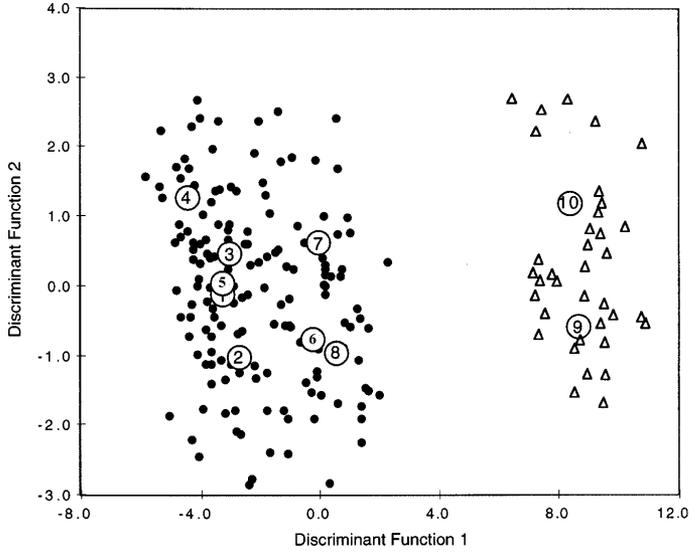
	Function 1	Function 2
Log (width)	0.80	0.13
Log (thickness)	-0.23	0.65
Length	-0.06	-0.60
Log (pulvinus)	-0.05	-0.20

**Table 2.** Means of phyllode characters for the two groups resolved by MDA. Standard Deviations are in parentheses.

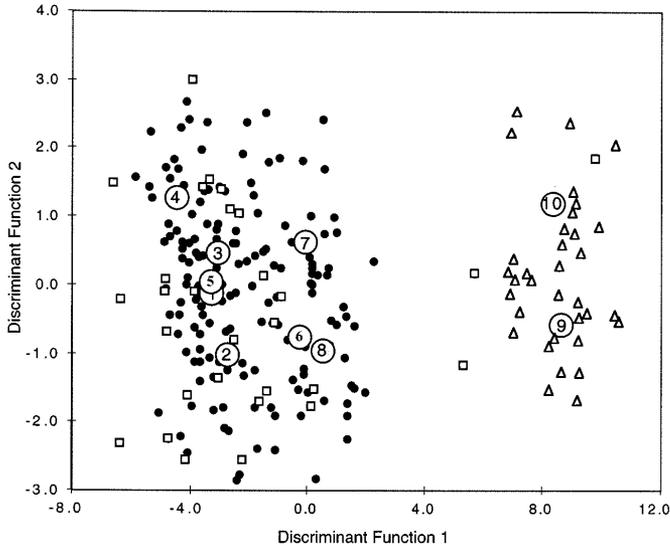
	Narrow phyllode group	Broad phyllode group
Width (mm)	1.1 (0.26)	3.3 (0.53)
Thickness (mm)	0.48 (0.07)	0.37 (0.05)
Length (mm)	46.7 (9.1)	40.4 (6.9)
Pulvinus length (mm)	1.53 (0.31)	1.65 (0.21)

Within the narrow phyllode group (Fig. 2) populations 1, 2 and 3 from the Little Desert National Park in the Wimmera, and 4 and 5 from near Inglewood in west-central Victoria, have very narrow phyllodes, averaging 0.9 mm. In comparison, populations 4 from Mt Arapiles in the Wimmera, and 7 and 9 from near Wychitella and Wedderburn respectively, in west-central Victoria, are characterised by less narrow phyllodes, averaging 1.3 mm broad. The difference in means of phyllode-width between the populations is not considered useful in delimiting taxa, especially since no other character distinguishes them.

There was no obvious pattern of separation along the second function (Fig. 2), which accounted for only 3% of the between-population variation. The variables length and log (thickness) were the most correlated (-0.60 and 0.65 respectively) with this function (Table 1). By convention, only correlations between variables and functions that were in excess of 0.30 (9% of variance) were interpreted (Tabachnick & Fidell 1989).



**Figure 2.** Plot of discriminant function values for phyllodes from individuals from the ten populations sampled in Victoria, and values for the population means. Individuals from populations 1–8, which comprise the narrow-phyllode group, are represented by filled circles; individuals from populations 9–10, which comprise the broad-phyllode group, are represented by open triangles; population means are presented by their population number in shaded circles.



**Figure 3.** Plot of discriminant function values for phyllodes from individuals from the ten populations sampled in Victoria, values for the population means, and values for phyllodes measured from herbarium specimens from across the geographic range of *Acacia calamifolia* s.l. Individuals from populations 1–8, which comprise the narrow-phyllode group, are represented by filled circles; individuals from populations 9–10, which comprise the broad-phyllode group, are represented by open triangles; population means are presented by their population numbers in shaded circles; individual herbarium specimens are represented by open squares.

Discriminant function values for phyllode variables from herbarium specimens fell within, or near, the range from those sampled in the field in Victoria (Fig. 3).

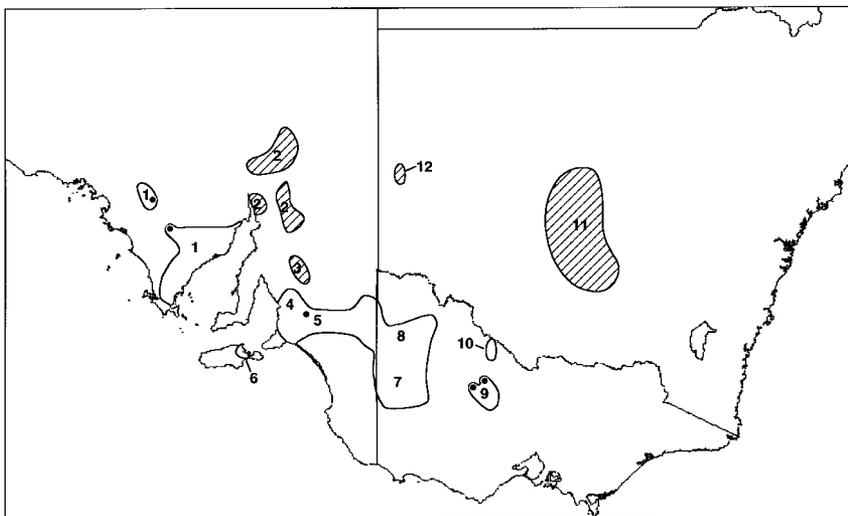
## Discussion

### THE SPECIFIC CIRCUMSCRIPTION OF *ACACIA CALAMIFOLIA* AND *A. EUTHYCARPA*

As legume type is generally considered constant with species of *Acacia* (New 1984), the differences in shape between the pods of *A. calamifolia* s.s. and *A. calamifolia* var. *euthycarpa*, in conjunction with differences in seed characters, provides evidence that *A. calamifolia* and *A. euthycarpa* are distinct species.

Furthermore, *A. euthycarpa* generally has two to four capitula per raceme and a rachis length of 1–8 mm. Based on examination of herbarium material, greater variation was detected in *A. calamifolia* s.s., with two to eight capitula per raceme and a rachis length of 5–25 mm. Sepals are united in *A. calamifolia* s.s., and on specimens of *A. euthycarpa* from Kangaroo Island and South Mount Lofty Ranges. Sepals are free on specimens of *A. euthycarpa* from other areas, suggesting geographic variation in sepal-fusion in this species.

Although nervation of the phyllode was not mentioned in the protologue of *A. calamifolia* var. *euthycarpa* (Black 1923), *A. euthycarpa* was described as having 3-nerved phyllodes ('sed phyllodiis arcte trinerviibus,' Black 1945: 310), and on a note on one of the types (AD 97333008) J.M. Black wrote 'phyllodes... about 3-nved (3-striate) on each face, obscurely 3-nvd.' This character would distinguish it from *A. calamifolia*. In reality this is incorrect; the phyllodes of *A. euthycarpa* are four nerved, with one nerve on each face, as in *A. calamifolia*. With age each face of the phyllode becomes faintly striate due to dessication. Care must be taken to distinguish true nerves from striations caused by long-term drying.



**Figure 4.** Distribution map of taxa resolved within the *Acacia calamifolia* species complex, showing geographical regions. Distribution of *A. calamifolia* s. s. is shown by hatched areas; distribution of *A. euthycarpa* subsp. *euthycarpa* is shown by shaded areas; localities of *A. euthycarpa* subsp. *oblanceolata* is shown by filled circles. Geographical regions are numbered; Eyre Peninsula (1); Flinders Ranges (2); North Mount Lofty Ranges (3); South Mount Lofty Ranges (4); Murray Lands (5); Kangaroo Island (6); Wimmera (7); Mallee (8); west-central Victoria (9); Swan Hill district (10); Griffith-Cobar region (11); Broken Hill district (12).

*Acacia calamifolia* s.s. and *A. euthycarpa* have allopatric distributions. *Acacia calamifolia* s.s. occurs in New South Wales, the Flinders Ranges and the North Mount Lofty Ranges of South Australia (Fig. 4). It grows on shallow powdery calcareous loams, grey-brown calcareous earths, and red duplex soils. *Acacia euthycarpa* occurs in Victoria, on the Eyre Peninsula, Kangaroo Island, South Mount Lofty Ranges, and the Murray Lands of South Australia (Fig. 4). It grows on bleached to brownish sands, grey-brown calcareous earths, and mottled-yellow to red duplex soils. Both species grow in scrub or as an understorey species in woodland or open woodland, often on rocky sites. They both grow in a range of rainfall conditions from 150–500 mm mean annual rainfall (arid to moderately arid conditions).

#### PHYLLODE FORMS IN VICTORIA – TWO SUBSPECIES OF *A. EUTHYCARPA*

The MDA distinguished two forms within *A. euthycarpa*: the broad-phyllode and narrow-phyllode forms. *Acacia euthycarpa* subsp. *euthycarpa* is referable to the narrow-phyllode form, while the name *A. euthycarpa* subsp. *oblanceolata* is proposed for the broad-phyllode form. The mean phyllode width of *A. euthycarpa* subsp. *oblanceolata* (3.3 mm) is about three times that of *A. euthycarpa* subsp. *euthycarpa* (1.1 mm). There are also lesser differences in the means of the other characters, with *A. euthycarpa* subsp. *oblanceolata* tending to have shorter, thinner phyllodes with longer pulvini and a shorter distance to the widest point. Some of the important differences are illustrated in Figure 5. *Acacia euthycarpa* subsp. *oblanceolata* is geographically widespread over a range of approximately 850 km, but is known only from two localities in Victoria.

It should be pointed out that *A. euthycarpa* is much more common in Victoria than *A. calamifolia* (*A. calamifolia* is known to us only from few, very old collections), and that the description of the latter provided by Willis (1972) applies to *A. euthycarpa*.

The phyllodes of *A. × grayana* are very similar to those of *A. euthycarpa* subsp. *oblanceolata*, and the two taxa are difficult to tell apart in flower. However, *A. × grayana* has submoniliform fruit as well as pubescent new shoots and peduncles (Entwisle *et al.* 1996).

*Acacia euthycarpa* subsp. *oblanceolata* grows on grey-brown calcareous earths, mottled-yellow to red duplex soils, and sometimes sand. It occurs in areas of mean annual rainfall ranging between 300 and 500 mm, suggesting that it has a lower tolerance to arid conditions than *A. euthycarpa* subsp. *euthycarpa* (range 150–500 mm). Localities of *A. euthycarpa* subsp. *oblanceolata* are on the periphery of the distribution of *A. euthycarpa* subsp. *euthycarpa*, which may suggest a different ecological preference, or it may be a pattern associated with agricultural clearing.

#### Key to taxa

1. Legumes (submoniliform to) moniliform; seed 6–9 mm long, the funicle encircling the seed by about 1/2 the circumference; phyllodes 0.7–4.5 mm wide, if 2 mm wide or wider, then new shoots and peduncles subglabrous to covered in hairs
  2. Phyllodes 0.7–1.2 mm wide ..... **1. *Acacia calamifolia***
  2. Phyllodes 2–4.5 mm wide..... **2. *A. × grayana***
1. Legumes linear; seed 4–6 mm long, the funicle entirely encircling the seed; phyllodes 0.7–6.0 mm wide, if 2.0 mm or wider, the new shoots glabrous to glabrate
  3. Phyllodes 0.7–2.0 mm wide, narrowly linear..... **3A. *A. euthycarpa* subsp. *euthycarpa***
  3. Phyllodes 2.5–6 mm wide, narrowly oblanceolate..... **3B. *A. euthycarpa* subsp. *oblanceolata***

**1. *Acacia calamifolia*** Sweet ex Lindl., *Bot. Reg.* 10, t. 389 (1824). *Type citation*: ‘brought by Mr John Richardson, to Mr. Colvill, from the south-west interior of New Holland.’ Type not seen, description (*‘Legumina arcuata articulata...’*) and illustration decisive.

*Acacia pulverulenta* A. Cunn. ex Benth., *London J. Bot.* 1: 342 (1842), *nom. illeg., non*

*A. pulverulenta* Schldl. (1838). *Syntypes*: interior of New Holland [between the Loddon R. and Pyramid Hill, Vic.], 8 July 1836, T.S. Mitchell "230"; Mt Flinders [one of the peaks adjacent to L. Brewster which is c. 10 km S of Lachlan R. and c. 130 km N of Griffith, N.S.W.], June 1817, A. Cunningham 403 (not found). Neither of these syntypes of *A. pulverulenta* were located at K, and the Cunningham collections could not be found at MEL. The only syntype seen by us is the one collected on Mitchell's journey, with the number '230.'

*Shrub* 2–4 m high, plants glabrous throughout. *Phyllodes* narrowly linear, 4–10 cm long, 0.7–1.2 mm wide, 0.4–1.0 mm thick, terete to flat, green to grey-green, sometimes scurfy, shortly acuminate with delicate, curved apex; main longitudinal veins four in all, not prominent and the mid-veins often somewhat impressed; pulvinus 1–2 mm long; the small obscure gland inserted 1–10 mm above pulvinus. *Inflorescences* of simple axillary capitula, or of 2–8(–14)-headed racemes, rachis 5–25(–40) mm long, peduncles 4–10 mm long; the capitula with 25–40 golden yellow flowers, these 5-merous; calyx-lobes all united, corolla-lobes all free. Pods moniliform, woody to coriaceous, wrinkled, straight, curved or twisted, to 16 cm long, 3–6 mm wide, grey to brown, ± glaucous; seeds longitudinal in pod, oblong to elliptic in outline, 6–9 mm long, 2.5–4.5 mm wide, dull to slightly shiny, dark brown to black, the filiform funicle mostly 1-folded, encircling half of seed, aril clavate.

*Habitat and Distribution*: Found mostly in scrub and sometimes in woodland or open woodland, occasionally on rocky sites; mostly on shallow powdery calcareous loams, grey-brown calcareous earths, or red duplex soils. Flinders Ranges (SA), North Mount Lofty Ranges (SA), Griffith-Cobar region (NSW) and near Broken Hill (NSW).

*Phenology*: Flowers mostly September to November, but often found sparsely flowering throughout the year.

*Selected specimens examined*: SOUTH AUSTRALIA: Flinders Ranges, near Wilpena Pound, ca. 45 km NNE of Hawker, R. Hill 6, 14 Jul 1955 (MEL); Northern Flinders Range, Northern Chace's Range, rocky banks of Anginonor Creek, ca. 30 km NE of Hawker, D.N.Kraehenbuehl 310, 12 June 1961 (MEL); Oraparinna Natl Park, near headquarters, J.Z.Weber 2648, 19 Sep 1971 (AD, MEL); Morgan to Eudunda road, 2.8 km WSW of Sutherlands, NW side of road, F.E.Davies 1391, 22 Nov 1989 (AD, MEL).

2. *Acacia* × *grayana* J.H.Willis, *Victorian Naturalist* 73: 155 (1957). *Type citation*: 'Wraigworm Parish, south of Kiata and about 14 miles east of Dimboola. A.J.Gray s.n., 9.IX.1951.' (holotype MEL 1500364, also on the sheet, a sterile specimen of *A.* × *grayana*, same locality as type, leg. 3/1951; and a fruiting specimen collected from a tree raised from seed off the type at Wail Nursery, leg. 3/11/1953; also a specimen of *A. hilliana* and a specimen of *A. eithycarpa* subsp. *oblanceolata*, placed there 'for comparison' (J.H.Willis).)

*Acacia microcarpa* F.Muell. var. *linearis* J.M.Black, *Flora of South Australia* 4: 687 (1920). *Type citation*: 'Near Monarto South' (holotype AD).

*Shrub* or small *tree* to 3 m tall, glabrous save for the glabrate to densely appressed hairy peduncles and new shoots. *Phyllodes* elliptic-oblanceolate to broadly oblanceolate, 2.5–5.75 mm long, 2.0–4.5 mm wide, 0.25–0.8 mm thick, flat, dull green to brown-green, acuminate with a curved apex; longitudinal nerves four, one on each broad face of the phyllodes, the two lateral ones appearing as marginal nerves, often becoming more or less irregularly striate with dessication; pulvinus 0.75–1.25 mm, the obscure to subprominent gland inserted 4–9 mm above pulvinus. *Inflorescences* of solitary capitula or short racemes of 2–5-capitula; rachis 2–7 mm long, peduncles 4–12 mm long; the capitula with 20–35 flowers, these 5-merous; calyx-lobes free to the base, corolla-lobes free. *Pods* (sub)moniliform, to 7(–7.5) cm long, 6 mm wide; seeds longitudinal in pod, ± 6 mm long, the funicle encircling about half the seed.

*Habitat and Distribution*: In sandy soils, often where moist, and often with *Callitris*.

Known from north-western Victoria near Wyperfeld National Park and the Little Desert National Park.

*Phenology*: Blooming as early as June, but mostly through November.

*Selected specimens examined*: VICTORIA: Wimmera. Winiam, S of Nhill. *I.O. Maroske s.n.*, 11 Oct 1992 (MEL); west of Yarto, just within the eastern boundary of Wyperfeld Nat'l Park, *I.O. Maroske s.n.*, 25 Jun 1960 (MEL); 1/2 mile [0.8 km south of Kiata Store Kiata, *E.M. Canning 2981*, 11 Oct 1969 (CANB, MEL).

**3. *Acacia euthycarpa*** (J.M.Black) J.M.Black, *Trans. & Proc. Roy. Soc. South Australia* 69: 310 (1945) (Typus infra sub subsp. *euthycarpa* indicatur).

*Shrub* 2–4 m high, or occasionally a small *tree* to 10 m high; plants glabrous throughout. *Phyllodes* narrowly linear, narrowly oblanceolate to oblanceolate, 3–8 cm long, 0.7–6.0 mm wide, 0.3–0.8 mm thick, terete to flat, green to grey-green, sometimes scurfy, shortly acuminate with delicate, curved apex; main longitudinal veins four in all (one per face), not prominent and the mid-veins often somewhat impressed; pulvinus 1–3 mm long; the small obscure gland inserted 0–7 mm above pulvinus. *Inflorescences* of simple axillary capitula, or of 2–4(–6)-headed racemes; rachis 1–8(–14) mm long, peduncles 4–10 mm long; the capitula with 25–40 golden yellow flowers, these 5-merous; calyx-lobes free or united, corolla-lobes all free. *Pods* linear, coriaceous to crustaceous, smooth or nearly smooth, straight, curved or twisted, to 16 cm long, 3–6 mm wide, brown; seeds longitudinal in pod, oblong to elliptic in outline, 4–6 mm long, 2.5–4 mm wide, dull to slightly shiny, dark brown to black, the filiform funicle mostly 2–3-folded, entirely encircling the seed, aril clavate.

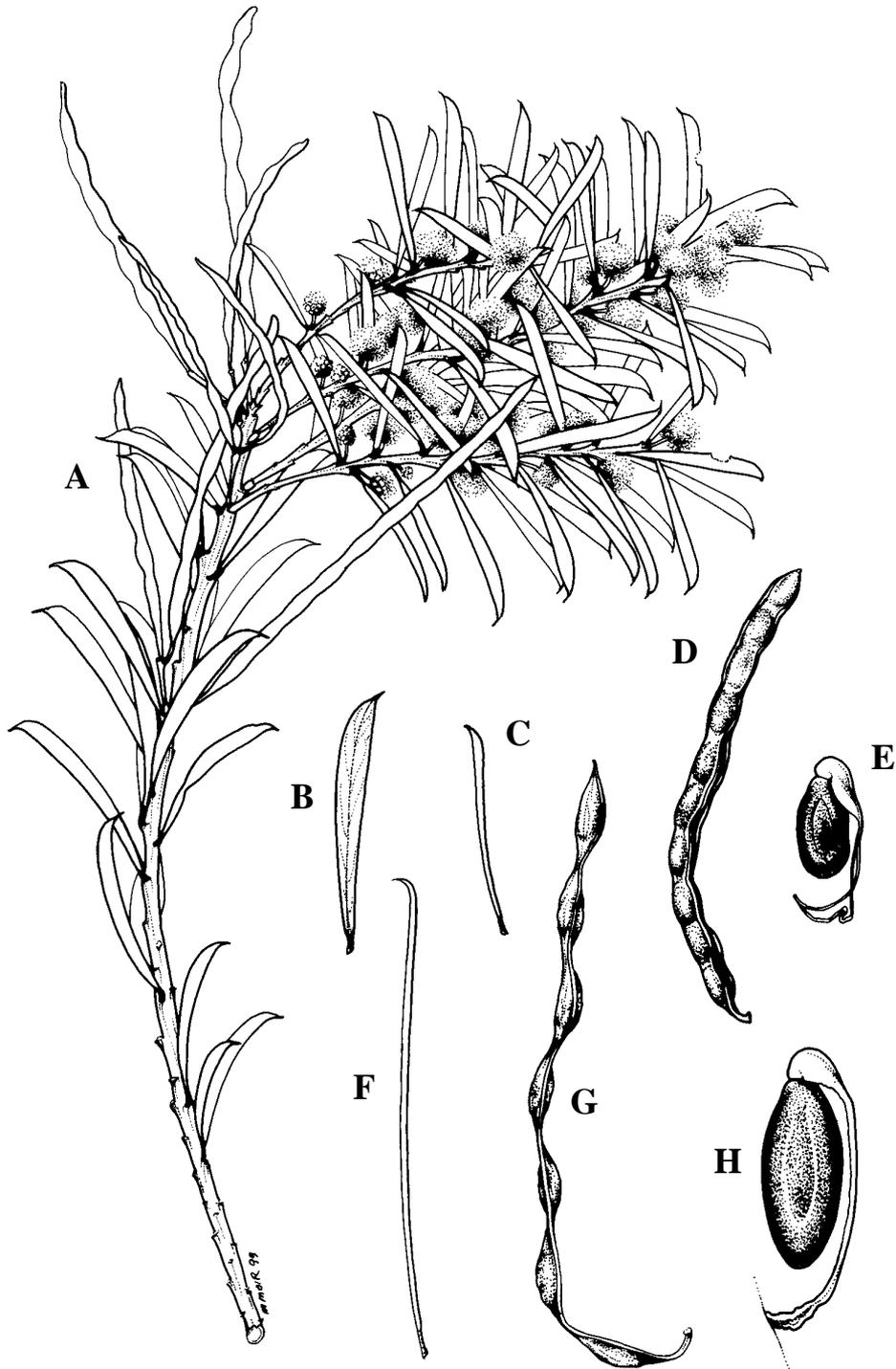
**3A. *Acacia euthycarpa*** (J.M.Black) J.M.Black **subspecies *euthycarpa***. *Acacia calami-folia* var. *euthycarpa* J.M.Black, *Trans. & Proc. Roy. Soc. South Australia* 47: 269 (1923), s. s. *Type citation*: 'Southern districts: Yorke [sic] Peninsula, Kangaroo Island, Eyre Peninsula.' (lectotype, here designated, AD 97333008, the fruiting specimen on the right-hand side of the sheet labelled 'Barossa Ranges, Nov. 1912'; syntype, also on AD 97333008: labelled 'Arno Bay [Eyre Peninsula]'; sterile spec.; but excluding a specimen labelled 'Nurioota' which is part of the Mount Lofty Ranges, not the York Peninsula; AD 97333011, labelled 'Port Lincoln [Eyre Peninsula]'; AD 973330006).

*Phyllodes* narrowly linear, 3–8 cm long, 0.7–2.0 mm wide, 0.3–0.8 mm thick, terete to flat; the gland inserted 0–7 mm above pulvinus.

*Habitat and Distribution*: Found mostly in scrub, woodland or open woodland, occasionally on rocky sites; mostly on bleached to brownish sands, grey-brown calcareous earths, and mottled-yellow to red duplex soils. Common in west-central Victoria, western Victoria, Kangaroo Island (SA), Eyre Peninsula (SA), South Mount Lofty Ranges (SA) and the Murray Lands (SA).

*Phenology*: Flowers mostly August to November.

*Selected specimens examined*: VICTORIA: 8.2 km S of Wychitella on Wychitella-Wedderburn Road, *S. Wright 13 and J. Grimes*, 7 Feb 1998 (AD, BRI, CANB, MEL, MELU, PERTH); State Park west of Inglewood, corner of Barry Rock Road and the road from the Logan-Inglewood Road to Melville Caves, *S. Wright 14 and J. Grimes*, 7 Feb 1998 (AD, CANB, MEL, MELU, PERTH); 8.6 km west of Inglewood on the Logan-Inglewood road, *S. Wright 15 and J. Grimes*, 7 Feb 1998 (MEL); 5.5 km SE of Wedderburn, Calder Highway between Wedderburn and Inglewood, *J. Connock 348*, 12 Sep 1992 (AD, MEL); Summit of Mt Arapiles, Mount Arapiles State Park, *P.G. Abeel 525 and C. Herscovitch*, 17 Dec 1986; 21.9 km N of Kaniva on the Broughton Road, *J. Grimes 3434 and B. Meurer-Grimes*, 13 Aug 1996 (AD, BH, CANB, MEL, NSW, NY); Wimmera. Lawlot Range, on Western Highway, *P.C. Jobson 3704*, 27 Aug 1995 (AD, BRI, CANB, MEL, NSW).



**Figure 5.** *Acacia euthycarpa* subsp. *oblanceolata*, and comparative illustrations of *A. euthycarpa* subsp. *euthycarpa*, and *A. calamifolia*. **A–B.** *A. euthycarpa* subsp. *oblanceolata*. **A** habit  $\times 0.7$ ; **B** phyllode  $\times 1$  (A from S. Wright 18; B from M.G. Corrick 5383); **C–E.** *A. euthycarpa* subsp. *euthycarpa*. **C** phyllode  $\times 1$ ; **D** fruit  $\times 1$  and **E** seed  $\times 3$  (from Maroske s.n., Dec. 1966). *Acacia calamifolia* **F–H.** **F** phyllode  $\times 1$ ; **G** fruit  $\times 1$ ; **H** seed  $\times 3$  (from R. Filson 3488).

**3B. *Acacia euthycarpa* subspecies *oblanceolata*** Stephen H. Wright, *subsp. nov.*

a *A. calamifolio* legumine lineari diversa; a *A. euthycarpa* subsp. *euthycarpa* phyllo-dio latiore (2.5–6 nec 0.7–2.0 mm) diversa (Fig. 5a–e)

*Typus*: VICTORIA, Yowang Hill, northeast of St Arnaud, 36°29'S 143° 22'E, S. Wright 18 (holotype MEL 2058890; isotypes AD, BRI, CANB, MELU, NSW, PERTH).

*Phyllodes* narrowly oblanceolate to oblanceolate, 3–6 cm long, 2.5–6.0 mm wide, 0.3–0.5 mm thick, flat, the gland inserted 0–5 mm above pulvinus.

*Habitat and Distribution*: Found in scrub or open woodland, often on rocky sites; on grey-brown calcareous earths and mottled-yellow to red duplex soils, sometimes on sand. Rare, occurring at only six known localities: Wychitella Flora and Fauna Reserve and Yowang Hill (west-central Victoria), Gawler Ranges and near Kima Eyre Peninsula (SA) and near Murray Bridge (the Murray Lands SA). The specimen near Murray Bridge was collected in 1848 and this subspecies may no longer occur there.

*Phenology*: Flowers mostly August to October.

*Remarks*: Appears similar to *A. × grayana*, a hybrid between *A. euthycarpa* subsp. *euthycarpa* and *A. brachybotrya*, occurring near Kiata in the Little Desert, but may be distinguished from *A. × grayana* by its glabrous new shoots and peduncles and rectilinear pod.

*Conservation status*: A ROTAP code of 3R is proposed for Victoria. The subspecies is fairly widespread but occurs in relatively isolated populations. Though on both crown land and in reserves, in many places it is threatened by sheep grazing.

*Selected specimens examined*: SOUTH AUSTRALIA, Eyre Peninsula: S side of Eyre Highway, 30 km W of Port Augusta, P.C. Jobson 2726, 28 Oct 1993 (AD, MEL); c. 65 km W of Kimba, c. 27 km east of Kyancutta, T.R.N. Lothian 5409, 10 Oct 1986 (BRI, MEL, PERTH); 2.9 km south of Wychitella, on Wychitella-Wedderburn road, S. Wright 12 and J. Grimes, 7 Feb 1998 (CANB, MEL 2058891, MELU, PERTH).

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