

New combinations in the genus *Vachellia* (Fabaceae: Mimosoideae) from Australia

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Abstract

Based on the evidence that the genus *Acacia* sens. lat. is polyphyletic and the acceptance that the major groups warrant generic status, and because the name *Acacia* has been conserved with a new type, the following new combinations in *Vachellia* Wight & Arn. are necessary for Australian taxa formerly included in *Acacia* subg. *Acacia*: ***Vachellia bidwillii*** (Benth.) Kodela, ***V. clarksoniana*** (Pedley) Kodela, ***V. ditricha*** (Pedley) Kodela, ***V. douglasica*** (Pedley) Kodela, ***V. pachyphloia*** (W.Fitzg.) Kodela and *V. pachyphloia* subsp. ***brevipinnula*** (Tindale & Kodela) Kodela, ***V. pallidifolia*** (Tindale) Kodela, ***V. suberosa*** (A.Cunn. ex Benth.) Kodela, ***V. sutherlandii*** (F.Muell.) Kodela, and ***V. valida*** (Tindale & Kodela) Kodela. *Vachellia farnesiana* (L.) Wight & Arn., a pre-European introduction to Australia, has previously been transferred to the genus. *Acacia nilotica* (L.) Delile has been left for the attention of other researchers more familiar with this taxon, its synonymy and its various subspecies.

Introduction

Synopses of recent morphological and molecular studies showing that the genus *Acacia* sens. lat. is polyphyletic and requires division into at least five genera are provided by Maslin et al. (2003, 2003a). At the July 2005 International Botanical Congress in Vienna a conservation proposal by Orchard and Maslin (2003) was endorsed, resulting in the retypification of the genus *Acacia* (McNeill et al. 2005). This decision results in the type of the genus being changed from the African species *Acacia nilotica* (L.) Delile to the Australian species *Acacia penninervis* Sieber ex DC. As a result of this, if the genus is split, *Vachellia* Wight & Arn. is the earliest available name applicable to species formerly included in *Acacia* subg. *Acacia*, while the name *Acacia* is retained for species of the former *Acacia* subg. *Phyllodineae*, the majority of which occur in Australia.

In Australia there are eleven species of the former *Acacia* subg. *Acacia* (Pedley 2002); nine of these are endemic to tropical Australia. *Acacia farnesiana* (L.) Willd., which is widespread through the tropics in central America, Africa and Asia, probably arrived in Australia prior to European settlement (Kodela & Tindale 2001, Pedley 2002). The more recent introduction, *Acacia nilotica* subsp. *indica* (Benth.) Brenan (Fig. 1), which

is naturalised in Queensland and the Northern Territory, is now known to show genetic diversity in Australia indicating that more than one infraspecific taxon may be present here (Wardill et al. 2006).

Acacia farnesiana is the type of the genus *Vachellia*, so the combination *Vachellia farnesiana* (L.) Wight & Arn. (*Prodr. Fl. Ind. Orient.* 272, 1834) already exists. Plants of this taxon in Australia seem all to be referable to var. *farnesiana* (Pedley 2002, Kodela pers. obs., Seigler pers. comm.) (Fig. 2). Combinations in *Vachellia* for New World taxa of the former *Acacia* subg. *Acacia* have recently been made by Seigler and Ebinger (2006).

New combinations in *Vachellia* are made here for the endemic Australian taxa so that these names are available for use in floras and checklists. No combination, however, is made for *Acacia nilotica* (L.) Delile, which presents more difficulties (see Wardill et al. 2006) and has been left for the attention of other researchers more familiar with this taxon, its synonymy and its various subspecies.

New Combinations

1. *Vachellia bidwillii* (Benth.) Kodela, **comb. nov.** (Fig. 3)

Basionym: *Acacia bidwillii* Benth., *Linnaea* 26: 629 (1855).

Holotype: Queensland: 'Ad Wide-Bay, Australiae boreali-orientalis (Bidwill)' (K).

A. leptoclada var. (?) *polyphylla* Benth., *Fl. Austral.* 2: 416 (1864).

Holotype: 'East Coast' [Queensland], *R. Brown* [Bennett sheet No. 4331], 1802–5 (K; photo NSW).

A. bidwillii var. *bidwillii*, *Fl. Austral.* 2: 420 (1864), autonym.

A. bidwillii var. *polytricha* Domin, *Biblioth. Bot.* 89: 273 (1926).

Type citation: 'Nord-Queensland: Savannenwalder bei Mungana (DOMIN II. 1910)'
Holotype: Queensland: in xerodrymio apud opp. Mungana, *K. Domin* '5148', Feb 1910 (PR 527948).

2. *Vachellia clarksoniana* (Pedley) Kodela, **comb. nov.**

Basionym: *Acacia clarksoniana* Pedley, *Austrobaileya* 6: 184, fig. 1 A, B (2002).

Holotype: Queensland: 3.9 km from 'New Dixie' homestead, *J.R. Clarkson* 3585, 15 Oct 1980 (BRI). Isotypes: ILL, K, MEL, MO, NSW, PERTH, PR, QRS.

3. *Vachellia ditricha* (Pedley) Kodela, **comb. nov.** (Fig. 4)

Basionym: *Acacia ditricha* Pedley, *Austrobaileya* 1: 307 (1980).

Holotype: Queensland: Kowanyama Aboriginal Reserve on the Mitchell River, *B. Alpher*, Dec 1977 (BRI).

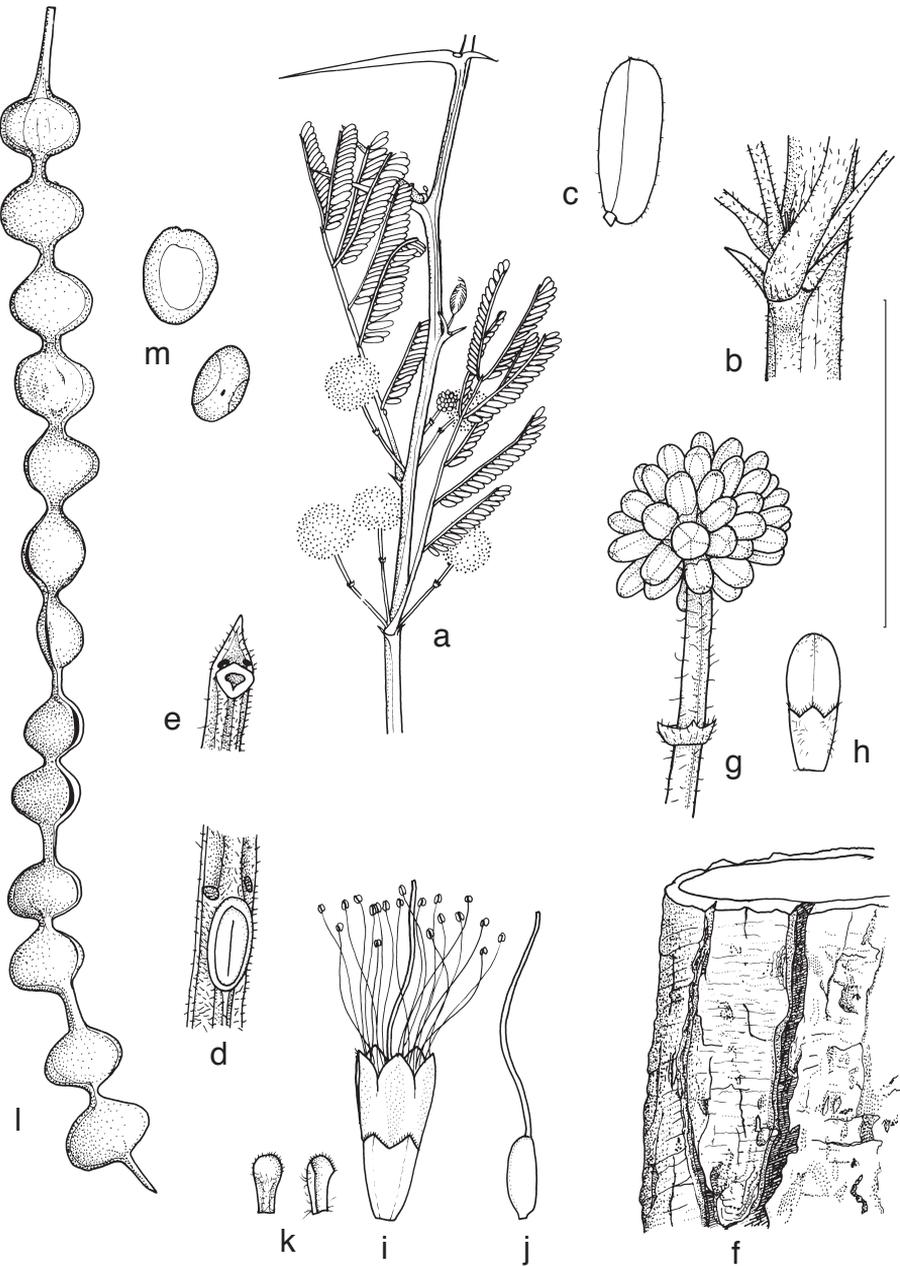


Fig. 1. *'Acacia' nilotica* subsp. ?*indica*. **a**, branchlet with leaves and inflorescences; **b**, leaf base and stipular spines; **c**, pinnule; **d**, petiolar gland; **e**, gland at apex of leaf rachis; **f**, bark; **g**, inflorescence in bud; **h**, flower bud; **i**, flower; **j**, gynoecium; **k**, bracteoles; **l**, pod; **m**, seeds. **a–e**, **i–k**, Newman 565 (NSW); **f**, Coveny 6925 & Hind (NSW); **g**, **h**, **l**, **m**, C.E.F. Allen (NSW271068). Scale bar = 0.6 cm (**d**, **e**, **h–k**), 1 cm (**c**), 1.2 cm (**b**, **g**), 3 cm (**m**), 6 cm (**a**, **f**, **l**).

4. *Vachellia douglasica* (Pedley) Kodela, *comb. nov.*

Basionym: *Acacia douglasica* Pedley, *Austrobaileya* 6: 181, fig. 1 C, D (2002).

Holotype: Northern Territory: 0.5 km W of Douglas River, *M. Parker* 508, 23 Oct 1974 (BRI). Isotypes: CANB, DNA, NSW.

Acacia 'Douglas R.', C.R. Dunlop *et al.*, *Fl. Darwin Region* 2: 20, fig. 4 (1995).

Note: Pedley (2002) suggested that Tindale and Kodela (1996) included *A. douglasica* as part of *A. ditricha* but this was not the case. Although specimens of the then undescribed species *A. douglasica* were known at the time and were considered as a possible variant of *A. ditricha* they were neither included in the description of *A. ditricha* nor cited in the Tindale and Kodela (1996) paper. The Douglas River taxon was later addressed in the *Flora of Australia* (Kodela & Tindale 2001: 202) under *Acacia bidwillii*.

5. *Vachellia pachyphloia* (W.Fitzg.) Kodela, *comb. nov.*

Basionym: *Acacia pachyphloia* W.Fitzg. in J.H. Maiden, *J. & Proc. Roy. Soc. New South Wales* 51: 116 (1917).

Type citation: 'Slopes of Bold Bluff; hills near C. 92, in proximity to the Synnott Range; hills by the Charnley and Calder Rivers (W.V.F.)'

Lectotype (*vide* Tindale & Kodela 1996: 311): Western Australia: near Synnott [Synnot] Range, *W.V. Fitzgerald* 1267, July 1905 (NSW). Isolectotype: PERTH.

Residual syntypes [paralectotypes]: slopes of Bold Bluff, *W.V. Fitzgerald*; hills by the Charnley and Calder Rivers, *W.V. Fitzgerald* (*n.v.*, location unknown).

5a. *Vachellia pachyphloia* (W.Fitzg.) Kodela subsp. *pachyphloia***5b. *Vachellia pachyphloia* subsp. *brevipinnula* (Tindale & Kodela) Kodela, *comb. nov.***

Basionym: *Acacia pachyphloia* subsp. *brevipinnula* Tindale & Kodela, *Austral. Syst. Bot.* 9: 314, fig. 3 (1996).

Holotype: Western Australia: 26 km N of turnoff to Mitchell Falls along road to Port Warrender, *M. McDonald* 336, 14 June 1987 (NSW). Isotype: PERTH.

6. *Vachellia pallidifolia* (Tindale) Kodela, *comb. nov.* (Fig. 5)

Basionym: *Acacia pallidifolia* Tindale, *Telopea* 1: 82 (1975), based on *Acacia pallida* F. Muell., *J. Linn. Soc., Bot.* 3: 147 (1859), *partim, non* Humb. et Bonpl. ex Willd. (1806).

Lectotype (*vide* Tindale, *loc. cit.*): Northern Territory: Fitzmaurice River, 'arbuscula in campis apricis', *F. Mueller* 76, 75, Oct 1855 (MEL). Isolectotype: NSW.

Residual syntypes [paralectotypes]: McAdam Range, *F. Mueller* 75, Oct 1855 (K, PERTH).

Acacia turbata Pedley, *Austrobaileya* 6: 180 (2002).

Holotype: Northern Territory: E of Mary River, *S.T. Blake* 17095, 29 Sep 1946 (BRI). Isotype: NSW.

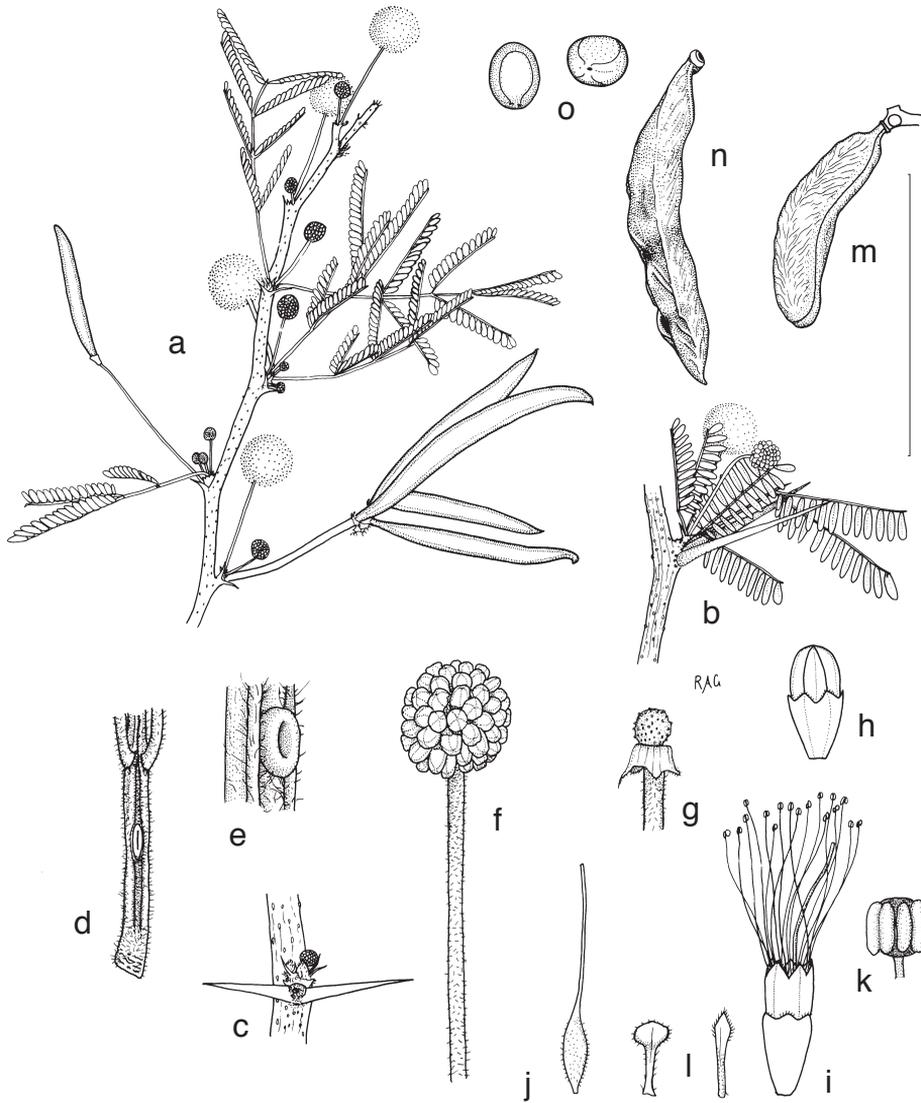


Fig. 2. *Vachellia farnesiana* var. *farnesiana*. **a**, branchlet with leaves, inflorescences and immature pods; **b**, leaves, inflorescences and stipular spines; **c**, stipular spines; **d**, petiole showing gland; **e**, petiolar gland; **f**, inflorescence in bud; **g**, involucre of united bracts at apex of peduncle (usually hidden by flowers); **h**, flower bud; **i**, flower; **j**, gynoecium; **k**, anther; **l**, bracteoles; **m**, **n**, pods; **o**, seeds. **a**, **f**, **h**–**j**, **l**, *Coveny 6572 & Powell* (NSW); **b**, **d**, *Milvain* (NSW108509); **c**, **m**, *K. Moore* (NSW108510); **e**, *G.M. Cunningham 704* (NSW); **g**, *Milthorpe 3821* (NSW); **k**, *Rodd s.n.* (NSW70825), **n**, **o**, *Coveny 6522 & Powell* (NSW). Scale bar = 0.075 cm (**k**), 0.4 cm (**e**), 0.6 cm (**h**–**j**, **l**), 1.2 cm (**d**, **f**, **g**), 2 cm (**c**), 3 cm (**o**), 6 cm (**a**, **b**, **m**, **n**).

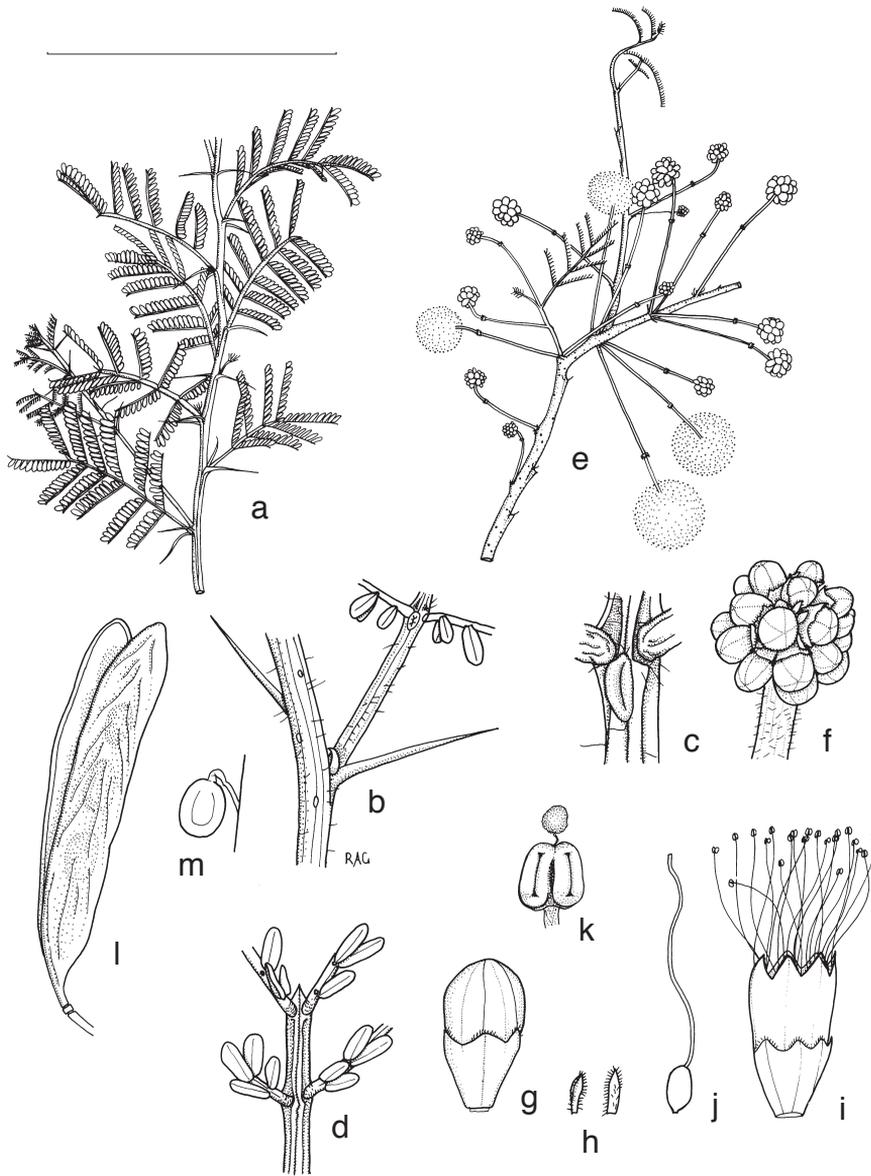


Fig. 3. *Vachellia bidwillii*. **a**, branchlet with leaves; **b**, petiole and stipular spines; **c**, petiolar gland; **d**, apex of leaf rachis; **e**, inflorescences; **f**, inflorescence in bud; **g**, flower bud; **h**, bracteoles; **i**, flower; **j**, gynoecium; **k**, anther; **l**, pod; **m**, seed. a–l, *Tindale* (NSW52690); m, *Coveny* 6876 & *Hind* (NSW). Scale bar = 0.1 cm (k), 0.4 cm (c), 0.6 cm (g–j), 1 cm (b, d), 1.2 cm (f), 4 cm (m), 6 cm (a, e, l).

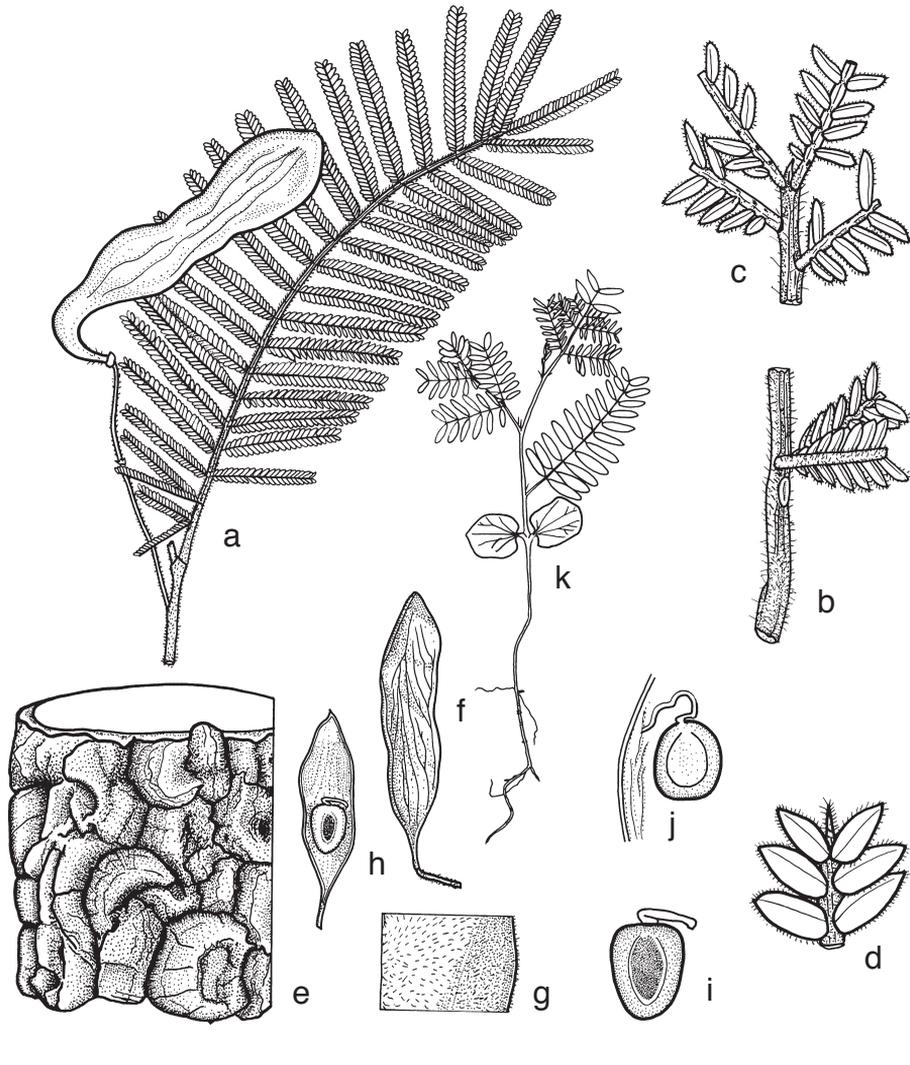


Fig. 4. *Vachellia ditricha*. **a**, apex of branchlet with leaf and pod; **b**, base of leaf showing petiolar gland; **c**, apex of leaf; **d**, apex of pinna; **e**, bark; **f**, pod; **g**, section of pod showing indumentum on outer surface; **h**, seed in pod; **i**, **j**, seeds; **k**, seedling. **a**, *Maconochie 206* (DNA); **b**–**d**, **j**, *Perry 2833 & Lazarides* (CANB); **e**–**i**, *Jacobs 1732* (NSW); **k**, AZRI (NT sheet), seedling grown from seed of *N. McK. Henry 7* (NT31554). Scale bar = 0.5 cm (**g**), 0.6 cm (**d**), 1.2 cm (**b**, **c**), 3 cm (**i**), 4 cm (**a**, **j**), 6 cm (**e**, **f**, **h**, **k**).

Note: The possible type material of *Acacia pallida* F.Muell., nom. illeg., includes two different taxa. However, there have been two different interpretations of this material that have resulted in the replacement name *A. pallidifolia* Tindale being applied to each of these two different taxa. We have followed the concept adopted by Tindale (1975) while Pedley (2002) applies this name to the taxon named *A. valida* by Tindale and Kodela (1996). To further add to the confusion, Pedley (2002) reverses Tindale's application of the name *Acacia pallidifolia*, renaming her species concept as *A. turbata* Pedley. The species concept originally adopted by Tindale (1975), and which was in use for almost 30 years, has now been challenged by Pedley's (2002) rejection of her lectotypification. While Pedley's view has merit, we suggest that nomenclatural stability is not well served by his approach because it would lead to a confusing reversal of names. A case for conservation of the name *A. pallidifolia* in the sense of Tindale (1975) is in preparation and will be submitted for consideration by the Committee for Spermatophyta.

7. *Vachellia suberosa* (A.Cunn. ex Benth.) Kodela, **comb. nov.** (Fig. 6)

Basionym: *Acacia suberosa* A.Cunn. ex Benth., *London J. Bot.* 1: 499 (1842).

Lectotype (*vide* Kodela, *Fl. Australia* 11A: 642, 2001): Western Australia: Careening Bay, North West Coast, 3rd Voyage of 'Mermaid', *A. Cunningham* 300, Sep 1820 [larger, right-hand element] (K). Isolectotype: BM.

Residual syntypes [paralectotypes]: Western Australia: Encounter Cove, Vansittart Bay, North West Coast, 2nd Voyage of 'Mermaid', *A. Cunningham* 488, Oct 1819 (BM, K).

8. *Vachellia sutherlandii* (F.Muell.) Kodela, **comb. nov.** (Fig. 7)

Basionym: *Albizia sutherlandi* F.Muell., *Fragm.* 6: 22 (1867). *Acacia sutherlandii* (F.Muell.) F.Muell. (as 'Sutherlandi'), *Iconogr. Austral. Acacia* Dec. 12: [pl. 8] (June 1888).

Holotype: Queensland: Flinders River, *J. Sutherland* 114 (MEL).

Acacia melaleucoides F.M.Bailey, *Proc. Roy. Soc. Queensland* 5: 121 (Sep 1888).

Holotype: Queensland: South-eastern slope of Newcastle Range, between Georgetown and Junction Ck, *R.C. Burton* (?BRI, *n.v.*)

9. *Vachellia valida* (Tindale & Kodela) Kodela, **comb. nov.**

Basionym: *Acacia valida* Tindale & Kodela, *Austral. Syst. Bot.* 9: 307, fig. 1 (1996).

Holotype: Northern Territory: Mathison Ck, c. 91.5 km W of Katherine on the Victoria Hwy, *M.D. Tindale* 10101, *P. Munns* & *R. Turley*, 2 Aug 1989 (NSW). Isotypes: AD, BRI, CANB, DNA, K, MEL, MO, PERTH.

A. pallida F.Muell., *J. Linn. Soc., Bot.* 3: 147 (1859), *partim, non* Humb. et Bonpl. ex Willd. (1806).

A. bidwillii Benth. var. (?) *major* Benth. (as 'Bidwilli'), *Fl. Austral.* 2: 421 (1864).

Holotype: (Dry) ridges of the Victoria River, *F. Mueller* 76, Nov 1855 (MEL). Isotype: K.

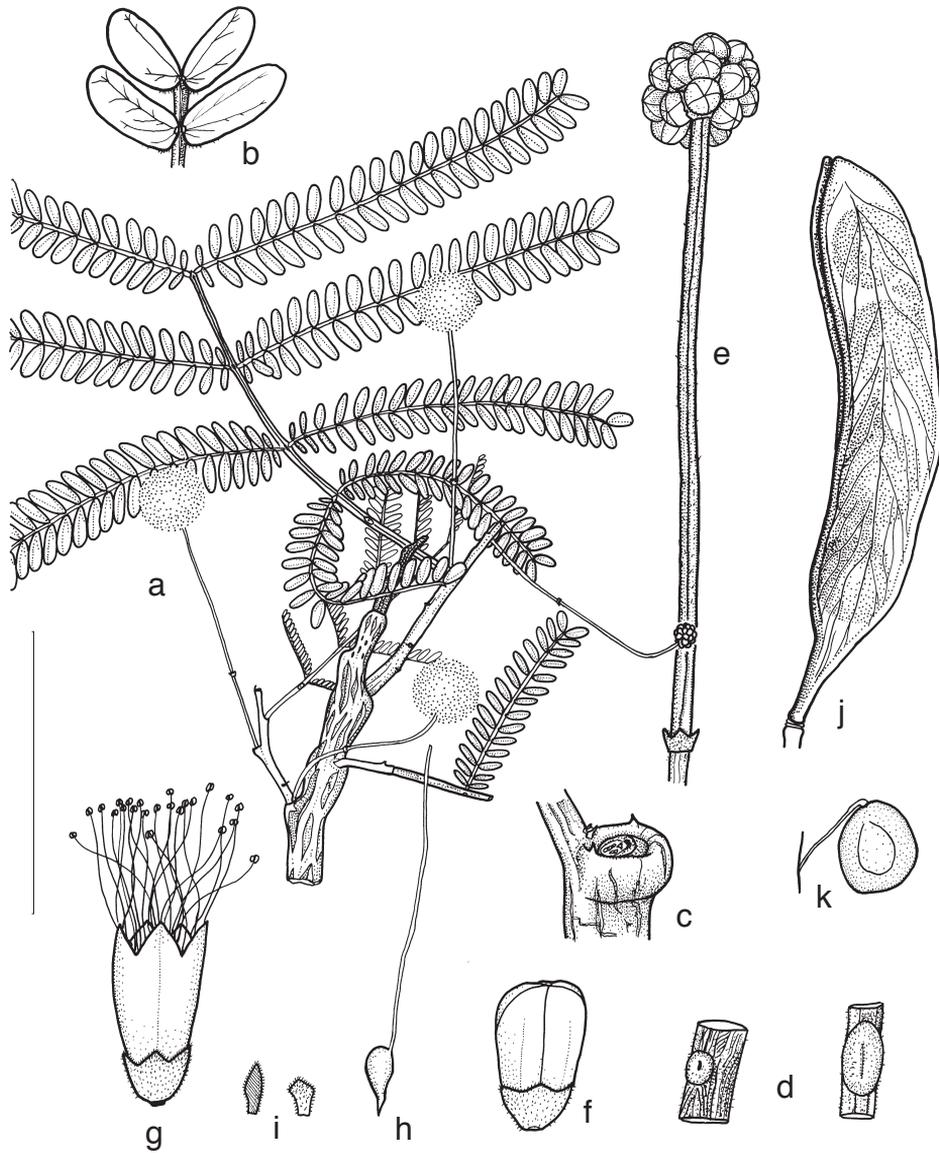


Fig. 5. *Vachellia pallidifolia*. **a**, branchlet with leaves and inflorescences; **b**, pinnules at apex of pinna; **c**, leaf scar showing small stipular spines; **d**, leaf glands; **e**, inflorescence in bud; **f**, flower bud; **g**, flower; **h**, gynoecium; **i**, bracteoles; **j**, pod; **k**, seed. **a**, **b**, **d**–**i**, *M. White* MR13(CANB); **c**, **j**, **k**, *Blake 17095* (NSW). Scale bar = 0.4 cm (**f**), 0.6 cm (**g**–**i**), 0.66 cm (**d**), 1.33 cm (**e**), 2 cm (**b**, **c**), 4 cm (**k**), 6 cm (**a**, **j**)

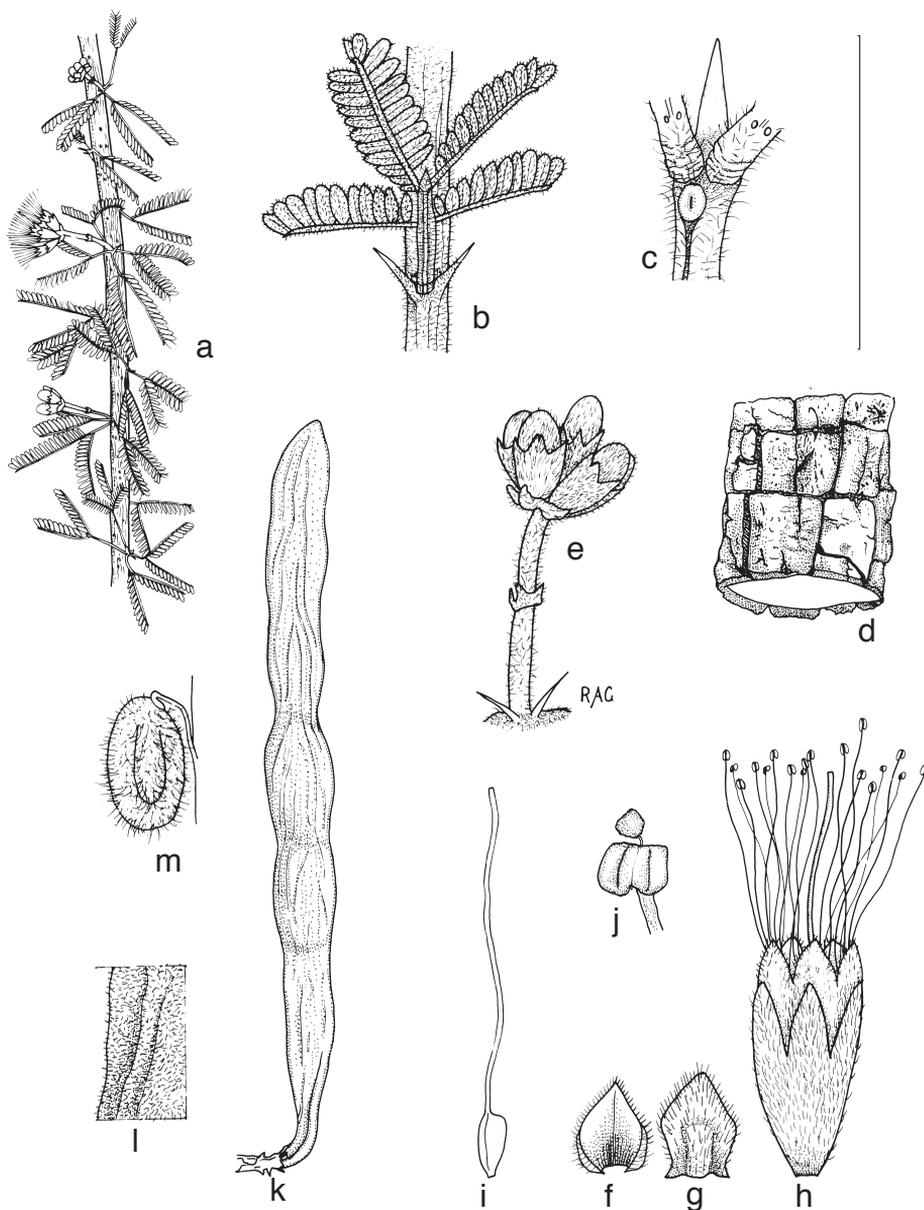


Fig. 6. *Vachellia suberosa*. **a**, branchlet with leaves and inflorescences; **b**, leaf and stipular spines; **c**, gland at apex of leaf rachis; **d**, bark; **e**, inflorescence in bud; **f**, inner surface of bracteole; **g**, outer surface of bracteole; **h**, flower; **i**, gynoecium; **j**, anther; **k**, pod; **l**, section of pod showing indumentum on outer surface; **m**, seed. **a**, **c**, **e**, **j**, Lazarides 7744 (NSW); **b**, Lazarides 3104 (NSW); **d**, Maconochie 1183 (NSW); **f**–**i** Byrnes 2228 (NSW); **k**–**m**, Lazarides 6515 (NSW). Scale bar = 0.1 cm (**j**), 0.3 cm (**l**), 0.4 cm (**c**), 0.6 cm (**f**–**i**), 1.5 cm (**e**), 2 cm (**b**), 4 cm (**m**), 6 cm (**a**, **d**, **k**).



Fig. 7. *Vachellia sutherlandii*. **a**, part of branchlet with leaf and inflorescence; **b**, part of leaf rachis showing petiolar gland; **c**, apex of pinna; **d**, bark; **e**, flower bud; **f**, flower; **g**, gynoecium; **h**, bracteoles; **i**, anther; **j**, pod; **k**, seed. **a**–**c**, **e**–**i**, *Waterhouse s.n.* (NSW108060); **d**, *Jacobs 1374* (NSW); **j**, **k**, *Hind 1069 & Ingram* (NSW). Scale bar = 0.1 cm (**i**), 0.6 cm (**c**, **e**–**h**), 1 cm (**b**), 4 cm (**k**), 6 cm (**a**, **d**, **j**).

Note: Pedley (2002) treated *A. valida* as a synonym of *Acacia pallidifolia*. Correct application of the latter name is contingent upon resolution of the issue of its typification, as discussed above.

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References

- Kodela PG & Tindale MD (2001) *Acacia* subg. *Acacia*. *Flora of Australia* 11A: 196–207.
- Maslin BR, Miller JT & Seigler DS (2003) Overview of the generic status of *Acacia* (Leguminosae: Mimosoideae). *Australian Systematic Botany* 16: 1–18.
- Maslin BR, Orchard AE & West JG (2003a) Nomenclatural and classification history of *Acacia* (Leguminosae: Mimosoideae), and the implications on generic subdivision. Paper on Worldwidewattle website at <http://www.worldwidewattle.com/infogallery/taxonomy/nomen-class.pdf>
- McNeill J, Stuessy TF, Turland NJ & Hörandl E (2005) XVII International Botanical Congress: preliminary mail vote and report of Congress action on nomenclature proposals. *Taxon* 54 (4): 1057–1064.
- Orchard AE & Maslin BR (2003) Proposal to conserve the name *Acacia* (Leguminosae: Mimosoideae) with a conserved type. *Taxon* 52: 362–363.
- Pedley L (2002) A conspectus of *Acacia* subg. *Acacia* in Australia. *Austrobaileya* 6: 177–186.
- Seigler DS & Ebinger JE (2006) New combinations in the genus *Vachellia* (Fabaceae: Mimosoideae) from the New World. *Phytologia* 87 (3): 139–178. [dated Dec 2005, published 5 Jan 2006]
- Tindale MD & Kodela PG (1996) *Acacia valida* (Fabaceae, Mimosoideae), a new species from Western Australia and the Northern Territory, as well as the typification and revision of *A. pachyphloia*. *Australian Systematic Botany* 9: 307–317.
- Wardill TJ, Graham GC, Zalucki M, Palmer WA, Playford J & Scott KD (2006) The importance of species identity in the biological control process: identifying the subspecies of *Acacia nilotica* (Leguminosae: Mimosoideae) by genetic distance and the implications of biological control. *Journal of Biogeography* 32: 2145–2159.

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