



# PHYTOTAXA

300

## A monograph of *Daviesia* (Mirbelieae, Faboideae, Fabaceae)

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**A monograph of *Daviesia* (Mirbelieae, Faboideae, Fabaceae)**  
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## Abstract

*Daviesia* is a clade of scleromorphic shrubs that are endemic to Australia and its near offshore islands, where it is the largest genus of Fabaceae subfam. Faboideae, with 131 species recognised here. The genus is distributed throughout the continent and occurs in all major habitats except wetlands, rainforest and the alpine zone. This is the first monograph of the genus published since Bentham's in 1864, which included only 55 species. New taxa described herein are *D. divaricata* subsp. *lanulosa*, *D. filipes* subsp. *terminalis*, *D. subulata*, *D. schwarzenegger* and *D. scabrella*. New combinations with a change of rank are *D. aphylla*, *D. decurrens* subsp. *hamata* and *D. implexa*, while *D. devito* is raised from subspecies level and given a new epithet. A key to species and subspecies, detailed comparative descriptions, phenology and habitat information, as well as line drawings or photographs, are presented for all species. Conservation status is given for taxa of concern, mostly based on assessments by government agencies. A new molecular phylogenetic analysis using sequences of chloroplast and nuclear ribosomal DNA is presented and used to arrange the species descriptions, where the 13 unsequenced species are interpolated using morphological similarity. Seven strongly supported clades and seven mostly well-supported subclades are named informally for reference in discussion of affinities, but are not formally described because they lack morphological synapomorphies.

## Introduction

*Daviesia* Smith (1798: 220) is the most diverse genus of pea-flowered legumes in Australia, with ca. 130 known species and 18 non-autonym subspecies. *Pultenaea* Smith (1794: 35) and *Gastrolobium* Brown (1811: 16)—in its expanded circumscription, Chandler *et al.* 2002—are the next most diverse, with ca. 110 species each. Like much of the flora of Australia's abundant oligotrophic soils (Hooker 1860, Orians & Milewski 2007, Crisp & Cook 2013), *Daviesia* is characterised by its scleromorphic vegetative parts, which are particularly well developed. The leaves are usually hard and isobilateral, often spinescent and/or cylindrical in section, or vertically compressed, or reduced in size, sometimes to scales. They closely resemble the phyllodes of *Acacia* Miller (1754: [25]), and are here termed as such, though they likely evolved convergently in these two genera (Crisp & Weston 1987: 100). Three species have flattened, leaf-like cladodes (*D. alata*, *D. epiphyllum* and *D. pteroclada*). The roots of many species are bizarre, having a strange mode of secondary thickening in which successive arc-like cambia arise outside those of the previous season, forming flanges or rope-like structures on the roots ('cord roots', Pate *et al.* 1989). Most have the small yellow and red flowers typical of the tribes Bossiaceae (Bentham 1865: 440) Hutchinson (1964: 347) and Mirbelieae (Bentham 1837b: 35) Polhill & Crisp (1982: 55), apparently specialised for bee-pollination, but a few (*D. cunderdin*, *D. epiphyllum* and *D. speciosa*) have enlarged, modified red flowers probably pollinated by birds (Crisp 1994, Toon *et al.* 2014).

Species are found throughout the Australian continent and Tasmania but nowhere else, not even in New Guinea; however, more than 70% are restricted to south-west Western Australia. All are found either in eucalypt-dominated communities (sclerophyll forest, woodland or mallee) or in heathland. In south-west Western Australia, the heathlands and mallee-heaths are known by the indigenous name 'kwongan' (Pate & Beard 1984). Most are probably ecologically important nitrogen-fixers. Eighteen species have been tested and all were found to engage in symbiotic N<sub>2</sub>-fixation with bacterial N<sub>2</sub>-fixing symbionts (nodulation) (Werner *et al.* 2014a, 2014b). These 18 species are scattered across the phylogenetic breadth of the genus, being found in eight of the 12 non-nested informally named clades (Fig. 1), so nitrogen-fixing nodulation is likely to occur genus-wide. In eastern Australia, a few species in the *D. latifolia* group (Crisp 1991a) are dominant in forest understorey, especially when fire is reasonably frequent. Many species are restricted endemics and the genus appears informative about the historical biogeography and diversification of floristic regions within the Australian continent (Cook *et al.* 2015).

This monograph is the culmination of a series of papers by us that have progressively revised *Daviesia* and is the first complete account of the genus since Bentham (1864). When this study commenced in 1975, about 70 named species were recognised (e.g. Polhill 1981), but that number is now nearly doubled, mainly as a result of the discovery of many restricted endemics in south-west Western Australia. We have conducted extensive field work throughout Australia over four decades and have thereby studied and sampled every taxon described herein. Several taxonomic papers and flora treatments have been published to date in this revisionary series (Crisp 1980a, 1980b, 1982a, 1982b, 1984, 1986, 1987a, 1987b, 1990, 1991a, 1981b, 1992, 1995, Chandler & Crisp 1997, Crisp & Chandler 1997, Chandler & Crisp 1998, Crisp 2002). A molecular phylogeny (described in the next section)

forms the basis of an informal classification under which the descriptions of the species are arranged. There are also a key to all species and subspecies, sources of online geographic distribution maps, discussions of species' affinities and complete nomenclatural details including typification. A small number of taxa are described as new or changed in status.

## Phylogeny and Classification

**Background:**—*Daviesia* was first described by Smith (1798) based on early collections from Port Jackson (New South Wales) by surgeon J. White. Subsequently, Smith (1808a, 1808b) described several species based on White's specimens, as well as a couple from King George Sound (Western Australia) using collections by Archibald Menzies. Brown (1811) described two new species from cultivation at Kew gardens. Bentham (1837a) made the first major treatment, as part of a revision of legumes of the world. In this and two publications on Australian taxa (Bentham 1837b, 1864), he described more species in the genus than any other author before the late 20<sup>th</sup> Century. Moreover, his treatment in *Flora Australiensis* (Bentham 1864) stands as the most comprehensive revision of the genus to date. Over the next 100 years, more species were described by several authors, but there was no comprehensive treatment or revision.

*Daviesia* has always been accepted as a natural (monophyletic) genus with no controversy about its circumscription. It has been diagnosed primarily by the unique triangular, explosively dehiscent pods, and secondarily by the inflorescence and scleromorphic vegetative parts (e.g. Smith 1805, Brown 1811a, Bentham 1837a). (An expanded morphological diagnosis of the genus is given just before the key to species below.) One or two species have been transferred into or out of the genus, e.g. *D. abnormis* was previously included in *Latrobea* Meisner (1848: 219), but these have been the result of errors rather than doubt about the definition of the genus. Monophyly of *Daviesia* has been supported strongly by phylogenetic analysis. A cladistic parsimony analysis using morphological characters scored for 55 species in the genus (Pate *et al.* 1989) included three closely related genera as outgroups, namely *Viminaria* Smith (1805: 507), *Erichsenia* Hemsley (1905: t. 2777) and *Sphaerolobium* Smith (1805: 509). Monophyly of *Daviesia* was supported by synapomorphies in pod shape, phyllodinous seedling leaves and red deposits in the calyx tissue (the last character is reversed within the genus). However, the test of monophyly was weak because few outgroups were used. Subsequent tests of monophyly used parsimony (Crisp *et al.* 2000) and both parsimony and Bayesian inference (Crisp & Cook 2003) with ITS sequence data (nuclear ribosomal DNA). The first study (Crisp *et al.* 2000) used extensive outgroup sampling (97 spp.), including *Viminaria*, *Erichsenia* and *Sphaerolobium* and representative genera across Mirbelieae and related tribes, but included only two ingroup species (*D. rhizomata* and *D. pachyloma*). The second study (Crisp & Cook 2003) used the best taxon sample to date, with eight species from *Viminaria*, *Erichsenia* and *Sphaerolobium* and *Gompholobium* Smith (1798: 220), and included 46 species-level taxa of *Daviesia*. Monophyly of *Daviesia* was confirmed by a bootstrap score of 100 in both parsimony analyses and a posterior probability of 1.0 in the Bayesian analysis.

Whilst there has been consistent agreement about the circumscription of the genus, little progress has been made on its internal classification. Bentham (1837a, 1864) made two attempts at an infrageneric classification. The first was admittedly artificial, relying mainly on superficial features of vegetative morphology, and was informal because none of the five named taxa was assigned a rank. Later, in *Flora Australiensis*, Bentham (1864) used both vegetative and inflorescence characters to construct a completely new classification comprising nine series. He virtually ignored his earlier taxa and their names, however this classification too is largely artificial (Table 1). No further attempt at classification has been made, although Kuntze (1903) performed the trivial act of raising Bentham's series to sections.

We have published four species-level phylogenies of *Daviesia*, all of which aimed to investigate macroevolutionary questions, including the evolution of anomalous secondary thickening in the roots (Pate *et al.* 1989, Crisp & Cook 2003), signatures of diversification in phylogenies (Crisp & Cook 2009) and explanations for diversity hotspots (Cook *et al.* 2015). None of these analyses was used for taxonomy. The first of these phylogenies (Pate *et al.* 1989) was a parsimony analysis of morphology scored for 55 species. This study used Bentham's (1864) classification as a basis for sampling across the genus but the phylogeny was not congruent with Bentham's scheme. The main finding was that cord-rooted species did not form a single clade. The anomalous secondary thickening of cord roots was assumed to be uniquely evolved in *Daviesia* because such anatomy was unknown in

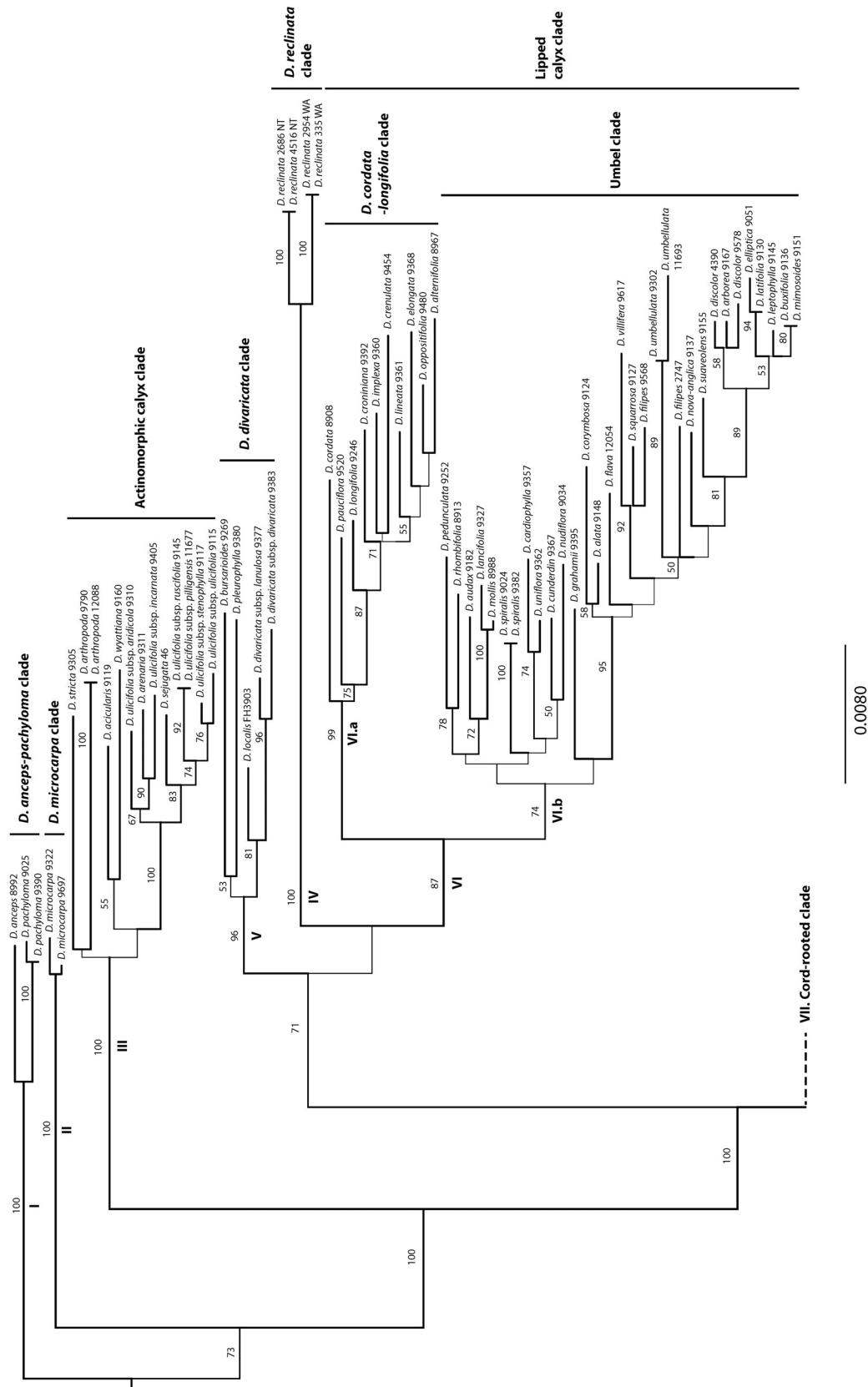
any closely related genus. Nevertheless, this trait was homoplastic on the trees, appearing to originate twice within *Daviesia*. Subsequently, three phylogenies were derived by Bayesian analysis of nrDNA (ITS [Internal Transcribed Spacers]) and cpDNA (trnL-F [the trnL(UAA)–trnF(GAA) region] and *ndhF* [NADH dehydrogenase F]) sequences from up to 83% (106 spp.) of the known species in the genus (Crisp & Cook 2003, 2009, Cook *et al.* 2015). Some well-supported clades were identified by these analyses but they were not formally named.

**TABLE 1.** Bentham's (1864) nine Series of *Daviesia* (later raised to Sections by Kuntze 1903: 165). Note that some species were listed by Bentham in several Series and he acknowledged that he was unable to distribute species into distinct sections. The Roman-numeral codes in the third column refer to clades in Figure 1 and not to Bentham's numerals in the first column.

Series	Constituents	Monophyletic in this study?
I. Involutratae	<i>D. alternifolia</i> , <i>D. cordata</i> , <i>D. crenulata</i> , <i>D. oppositifolia</i> , <i>D. elongata</i> , <i>D. ovata</i>	No. Mostly VI.a but part of VII.d and <i>D. longifolia</i> not included
II. Umbellatae	<i>D. mollis</i> , <i>D. pedunculata</i> , <i>D. umbellulata</i>	No. Part but not all of VI.b
III. Racemosae	<i>D. buxifolia</i> , <i>D. corymbosa</i> , <i>D. emarginata</i> , <i>D. horrida</i> , <i>D. latifolia</i> , <i>D. obovata</i> , <i>D. reclinata</i> , <i>D. umbellulata</i>	No. IV and parts of VI.b, VII.d and VII.e
IV. Calamiformes	<i>D. longifolia</i> , <i>D. nematophylla</i>	No. Parts of VI.a and VII.a
V. Fasciculatae	<i>D. acicularis</i> , <i>D. cardiophylla</i> , <i>D. daphnoides</i> , <i>D. filipes</i> , <i>D. nudiflora</i> , <i>D. rhombifolia</i> , <i>D. squarrosa</i> , <i>D. ulicifolia</i>	No. Parts of III, VI.b and VII.e
VI. Teretifoliae	<i>D. brevifolia</i> , <i>D. genistifolia</i> , <i>D. hakeoides</i> , <i>D. incrassata</i> , <i>D. pachyloma</i> , <i>D. pachyphylla</i> , <i>D. preissii</i> , <i>D. spinosissima</i> , <i>D. teretifolia</i>	No. Mostly VII.e, with parts of I, VII.c and VII.d
VII. Verticales	<i>D. incrassata</i> , <i>D. microphylla</i> , <i>D. polyphylla</i> , <i>D. preissii</i> , <i>D. quadrilatera</i> , <i>D. striata</i>	No. Part only of VII.e
VIII. Decurrentes	<i>D. brevifolia</i> , <i>D. epiphyllum</i> , <i>D. flexuosa</i> , <i>D. pectinata</i> , <i>D. spinosissima</i> , <i>D. trigonophylla</i>	No. Parts of VII.a, VII.d and VII.e
IX. Aphyllae	<i>D. alata</i> , <i>D. anceps</i> , <i>D. aphylla</i> , <i>D. brevifolia</i> , <i>D. divaricata</i> , <i>D. euphorbioides</i> , <i>D. gracilis</i>	No. Parts of I, V, VI.b, VII.b, VII.d and VII.e

Here, we present a new phylogeny with the largest sample of species to date (90%, 118 of 131 species). We use this tree as a basis for arranging the taxonomic treatment in this monograph, by grouping species into well-supported clades, but have not formally named them because much of the phylogeny is still insufficiently resolved to provide a stable classification. Moreover, we have not found morphological diagnostic characters for most of these clades. We also briefly revisit the evolution of root anatomy trait shifts on the phylogeny.

**Material and methods:**—The phylogeny was derived from three loci: one from nuclear ribosomal DNA (ITS) and two from the chloroplast (*ndhF* and trnL-F). Sequence data used by Cook *et al.* (2015) were supplemented with 12 additional species and 343 newly obtained sequences (Appendix 1), using laboratory methods described by Crisp & Cook (2009). The taxon sample included 118 species of *Daviesia* with the monotypic genera *Erichsenia* and *Viminaria* as outgroups, which previous analyses (described in the Introduction) had shown as the most likely sister group to *Daviesia*. Most species are represented by one or two accessions, or up to five for problematic species complexes in the *D. aphylla*, *D. benthamii* and *D. genistifolia* clades (Fig. 1). Known or suspected hybrids (see under Species Delimitation below) were excluded from the analysis. We did not use morphological characters: only half the species have been scored for morphology, and these data give very poor resolution when analysed separately (not shown). When mapped onto a molecular phylogeny, morphological characters were highly homoplasious (e.g. Crisp & Cook 2003). Sequences were assembled in Geneious v. 9.1.4 (Biomatters Ltd) and aligned using MAFFT v. 7.222 (Kato *et al.* 2002) with default settings, then adjusted by eye. The protein-coding *ndhF* sequences were aligned to the open reading frame. After carrying out separate analyses of the nuclear and chloroplast loci and finding no supported conflicts in the topologies, all three loci were concatenated to estimate the final tree. Maximum likelihood tree searches were conducted using PhyML v. 3.0 (Guindon *et al.* 2010) with a GTR + G model and BEST branch swapping. Branch support was estimated using 100 pseudo-replicates of the non-parametric bootstrap (BS) implemented in PHYML. The maximum likelihood tree showing branch lengths and branch support was visualised using FigTree v. 1.4.0 (Rambaut 2012). The evolutionary history of root anatomy (anomalous versus normal secondary thickening) was reconstructed on the phylogeny using parsimony mapping in Mesquite v. 3.10 (Maddison & Maddison 2016).



**FIGURE 1A.** Phylogeny (part) of *Daviesia* estimated using maximum likelihood (PHYML) from concatenated sequences of ITS (nrDNA), and *ndhF* and *trnL-trnF* (cpDNA). The tree was rooted using the monotypic sister groups *Viminaria* and *Erichsenia* (not shown). The informal clade names are used for reference in the taxonomic treatment. Numbers on branches show non-bootstrap support. The tips are labelled with the taxon name and sample accession number.



**Results:**—The maximum likelihood tree was broadly congruent with the previously published molecular phylogenies, at least with respect to the well-supported clades labelled with informal names in Fig. 1. Resolution and branch support are improved from previous analyses (cf. Crisp & Cook 2003, Cook *et al.* 2015) but remain low within many of the larger clades (Fig. 1). The number of species scored for root anatomy is now 82 (cf. 44 in Crisp & Cook 2003). Reconstruction of root anatomy evolution onto the phylogeny (not shown) found—as before—that almost all cord-rooted species occur in the clade given that name (Clade VII, Fig. 1B), though two or more losses of cord root anatomy are inferred within that clade: one in *D. horrida* (Clade VII.d, *D. hakeoides-obovata* clade), and one or more in *D. nematophylla*, *D. purpurascens*, *D. scoparia* and *D. subulata* (Clade VII.a, *D. benthamii* clade). Independent gains of cord roots are also inferred in the *D. anceps-pachyloma* clade (Clade I; 1 gain, 2 spp.), the *D. divaricata* clade (Clade V; 1 gain, 1 sp.), and in the *D. cordata-longifolia* clade (Clade VI.a; 1 gain, 1 sp.). Additionally, we have observed cord root anatomy in outgroup genera *Aotus* Smith (1805: 504), *Eutaxia* Brown (1811: 16), *Latrobea*, *Phyllota* (Candolle 1825: 113) Bentham (1837b: 33), *Pultenaea* and *Urodon* Turcz (1849: 16), all of which belong in the *Pultenaea s.l.* clade of the Fabaceae tribe Mirbelieae (Orthia *et al.* 2005). In summary, cord root evolution now appears to be more labile than previously thought (Pate *et al.* 1989, Crisp & Cook 2003), with multiple gains and losses inferred both within *Daviesia* and among closely related genera.

**Discussion:**—Despite strong support for some clades in the phylogeny (those numbered and named in Fig. 1), no formal classification of the genus has been attempted here. We have assigned numbers and informal names to some clades for the purpose of referring to the phylogeny when discussing affinities of species in the taxonomic treatment that follows. Our main reason for not making a formal classification is that most of the molecular clades do not have evident morphological synapomorphies, not even those given names based on morphological characters. For instance the ‘Umbel’ clade (VI.b, Fig. 1A) also includes species with uniflorous and racemose unit inflorescences. Cord-root anatomy is predominant but neither universal within, nor restricted to, the ‘Cord-rooted’ clade (VII, Fig. 1B). For example, the separate Clade I comprises two species, *D. anceps* and *D. pachyloma*, both of which are cord-rooted. Note also that the molecular clades map very poorly to Bentham’s (1864) classification of 55 species into nine series, which were diagnosed using highly homoplastic morphological characters (Table 1). Species that were not included in the phylogenetic analysis (Fig. 1) have been assigned to the informally named clade groups in the taxonomic treatment using morphological similarity (cf. Cook *et al.* 2015).

## Species Delimitation

Species delimitation should be based upon a species concept and be a testable scientific hypothesis. We prefer the biological species concept (Coyne & Orr 2004, and references therein), which uses the testable criteria of reproductive continuity within and isolation between species. This concept has strong explanatory power and has withstood numerous challenges over a long period (Coyne & Orr 2004). However, measurement of reproductive continuity and isolation was beyond the scope of this large monographic treatment, and we have been forced to use surrogates, such as discontinuities in phenotypic variation and strong differentiation of multi-locus molecular clades. In the latter case, we do not regard mere monophyly (or not) in a gene tree as sufficient evidence of species differentiation (or not) because of the well-known effects of incomplete lineage sorting (Avise & Wollenberg 1997). Moreover, parphyly of species is expected (Crisp & Chandler 1996), especially because of incomplete lineage sorting, and if speciation was recent (Avise & Wollenberg 1997, Funk & Omland 2003). Species can be a reproductively compatible unit separate from other such units, even if paraphyletic (Omland *et al.* 2006, Lockhart *et al.* 2014). Consequently, we accept parphyly of species that include nested species that are strongly differentiated morphologically, and which are therefore likely to be reproductively isolated. For example, *D. arenaria* and *D. sejugata* are nested within a paraphyletic *D. ulicifolia*, with all three species comprising a strongly supported clade (BS = 100, Fig. 1A). We recognize these three species as distinct because they are well differentiated morphologically (Chandler & Crisp 1998). Moreover, there is indirect evidence for reproductive isolation between *D. ulicifolia* and *D. arenaria* because some accessions (*Crisp 9310* and *9311* respectively) were collected in close proximity on northern Eyre Peninsula, South Australia, and each is phenotypically typical of its taxon.

We also accept species as distinct, despite evidence of hybridization, if the hybrid zones are localised and evidence of extensive introgression between the species is lacking (cf. Coyne & Orr 2004). For example, we have



morphological and molecular evidence of hybridization between *D. aphylla* and *D. purpurascens* at a disturbed site (sand mine) in the Gnarlbine Rock area, SW of Coolgardie, Western Australia (Crisp 9396–9399), but hybrids between these species are unknown elsewhere despite extensive overlap in their distributions.

The molecular phylogeny (Fig. 1) has helped clarify species delimitation in the most difficult species complex in the genus but has also revealed problems that require further research to resolve. This complex comprises three clades of species with mostly spinescent, needle-like phyllodes, namely the *D. benthamii* (VII.a), *D. aphylla* (VII.b) and *D. genistifolia* (VII.c) clades (Fig. 1B). Taxonomic confusion in this complex is not surprising because needle-like phyllodes are widespread and homoplastic throughout the genus. In other words, species that are morphologically similar are often not closely related. Crisp (1980a) had attempted to resolve longstanding confusion between these taxa by transferring into *D. benthamii* the eastern Australian populations with non-articulate phyllodes that had previously been included in *D. genistifolia*, whose phyllodes articulate at the branchlet. He described these populations as *D. benthamii* subsp. *humilis*. Subsequently, Crisp (1995) reduced *D. aphylla* to a third subspecies (*acanthoclona*) of *D. benthamii*. Now, the molecular phylogeny shows that all three subspecies of *D. benthamii* are distinct species, each falling into different, well-supported clades that include other species, i.e. the *D. aphylla*, *D. benthamii* and *D. genistifolia* clades (Fig. 1B). Even more surprisingly, *D. benthamii* subsp. *humilis* actually consists of two cryptic species, here described as *D. schwarzenegger* and *D. devito* (= *D. benthamii* subsp. *humilis* s.s.). Specimens of *D. schwarzenegger* form a well-supported clade (BS = 92) sister to the rest of the *D. benthamii* clade, whereas *D. devito* (BS = 91) is reciprocally monophyletic with *D. genistifolia*, within the *D. genistifolia* s.l. clade. Closer examination has revealed diagnostic morphological characters for these cryptic species: *D. devito* has minute stipules (shared with *D. genistifolia*) that are absent in *D. schwarzenegger*. *Daviesia benthamii* s.s. and *D. aphylla* are also morphologically diagnosable from each other, and from *D. devito* and *D. schwarzenegger*.

Further complexity in this species complex arises because *D. campephylla*, *D. articulata* and *D. scabrella* are nested within *D. aphylla* (clade VII.b, Fig. 1B), thus rendering *D. aphylla* paraphyletic. All four species are readily diagnosable morphologically (see key and descriptions). Additionally, the first three species share a morphological synapomorphy (a scaberulous epidermis) that is lacking in *D. aphylla* and other close relatives.

Finally, the status of *D. purpurascens* and its relationship to *D. benthamii* s.s. is problematic. As currently circumscribed, *D. purpurascens* has a widespread distribution with disjunct populations in the Western Australian wheatbelt (type population, around Kondinin), goldfields and Great Victoria Desert, and in South Australia. *Daviesia benthamii* has a mostly non-overlapping distribution to the north-west of *D. purpurascens*, extending as far as the Coral Bay area (Gascoyne region). Some specimens appear intermediate in the characters that normally distinguish *D. purpurascens*, i.e. round pod shape and presence of a purplish tinge to the epidermis. Furthermore, the accessions of *D. purpurascens* (Crisp 6168, 9396 and 9397) in the molecular phylogeny (*D. benthamii* clade, VII.a, Fig. 1A) do not cluster together. The specimens 9396 and 9397 are likely hybrids with *D. aphylla* (see discussion under *D. purpurascens*). Resolution of the status of *D. purpurascens* and its relationship to *D. benthamii* s.s. and *D. aphylla* is beyond the scope of the present study and will be investigated using a much larger sample of these taxa.

## Layout, Formatting and Conventions used in this Monograph

In the taxonomic treatment, taxa are arranged in a sequence that reflects the tree as displayed in Fig. 1. Species and subspecies that were not sampled for the molecular phylogeny have been interpolated following the procedure of Cook *et al.* (2015), i.e. using their morphological similarity to species placed in the tree by the phylogenetic analysis. The format and terminology of the descriptions follow Stearn (1983), including his Fig. 19 for the description of plane shapes. Terminology such as ‘half broadly ovate’ is used throughout to describe the shape of the keel petal. This refers to a shape in Stearn (1983: Fig. 19)—in this example, ‘broadly ovate’, i.e. shape no. 40—halved longitudinally. This terminology is used because the keel is always asymmetrical. Secondary referencing of taxonomic treatments is not exhaustive, including only major revisions (e.g. Bentham 1864) and recent regional Australian flora treatments. Following ICN recommendation 50D (McNeill *et al.* 2012), references to misidentifications are listed after synonymies and placed within square brackets. Similarly, six phrase names recognised in the Australian Plant Census (APC; Council of Heads of Australasian Herbaria 2016), but which have no standing in the ICN (Art. 23), are listed in square brackets after the relevant synonymies.

**Specimen citation, databasing and distribution maps:**—All cited types have been seen and annotated, and photographs filed in an index kept by MDC. Specimens cited after each taxonomic treatment are only those studied for making the descriptions, plus vouchers (e.g. for line drawings). Many more specimens in Australian herbaria have been seen, verified and annotated by MDC and GTC. All these specimens are databased in Australia’s Virtual Herbarium (AVH; Council of Heads of Australasian Herbaria 2015), where our identifications and verifications are explicitly recorded. AVH integrates the specimen databases of the major Australian herbaria and is searchable online via an interface in the public domain, e.g. using taxon name and/or collector’s name and number. The Atlas of Living Australia (ALA; Australian Government 2016) provides an alternative public interface to the AVH, as well as tools for exploring, mapping and modelling biological distributions. Therefore, it seems unnecessary to list all specimens seen here, or to provide distribution maps. Specimens cited here are grouped by states of Australia, and within states by botanical districts as defined by the Australian National Herbarium (2016). In this treatment, the following abbreviations are often used for the Australian states and territories: Western Australia (WA), Northern Territory (NT), South Australia (SA), Queensland (Qld), New South Wales (NSW), Australian Capital Territory (ACT), Victoria (Vic.), Tasmania (Tas.). Elevations are not given in specimen citations because Australia is very flat and the vast majority of *Daviesia* populations occur below 1,000 m, and in any case, elevation is not often recorded by collectors. For the few taxa whose elevational range is noteworthy (e.g. *D. mimosoides* subsp. *acris*), it is mentioned in the habitat notes.

For distribution maps for all taxa treated herein, it is easy to search for the map (and specimen data) in either AVH, ALA or, for WA species, in FloraBase (Western Australian Herbarium 1998 onwards). For species occurring outside WA, we recommend using AVH in preference to ALA because the latter includes unvouchered (and therefore unverifiable) observational records. Online maps in any of the databases might show records outside the distributional range described in this treatment for some taxa. These are unverified by us and could represent extensions to the known range. However, they might be the result of errors, e.g. in identification of specimens, in interpreting place names, or in calculating or transcribing geographic coordinates.

**Conservation status:**—This is mentioned by us for any taxon that is given legal protection by at least one jurisdiction, and we report the formal ratings (most are legislated) by the Australian and State Governments. As the National and State governments often differ in their assessments of the conservation status of species, ratings are reported for every jurisdiction, where relevant. Australian Government ratings were obtained from the national list of threatened flora (Australian Government 1999 onwards). For Western Australia, we obtained conservation ratings from two sources: Government of Western Australia (2014) and FloraBase (Western Australian Herbarium 1998 onwards). Sources of data for three other states were: Queensland Government (2015), State of Victoria (2014) and South Australian Government (2015). In 2016, no species of *Daviesia* was listed as currently rare or threatened in New South Wales, Tasmania or the Northern Territory. Additionally, we give our own informal assessments for rare species newly described herein.

## Taxonomic Treatment

### *Daviesia* Smith (1798: 220)

Lectotype (Hutchinson 1964: 39): *D. acicularis* Smith (1805: 506).

*D. ser. Aphyllae* Benth (1864: 72). Type: Not designated—*D. aphylla* F.Muell. ex Benth (1864: 88) is an included species, but there is no indication that the name of this series is based upon it.

*D. ser. Calamiformes* Benth (1864: 70). *D. sect. Calamaria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Decurrentes* Benth (1864: 71). *D. sect. Decurraria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Fasciculatae* Benth (1864: 70). *D. sect. Fascicularia* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Involutratae* Benth (1864: 69). *D. sect. Involutraria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Racemosae* Benth (1864: 70). *D. sect. Racemaria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Teretifoliae* Benth (1864: 71). *D. sect. Teretaria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Umbellatae* Benth (1864: 69). *D. sect. Umbellaria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*D. ser. Verticales* Benth (1864: 71). *D. sect. Verticaria* Kuntze in Post & Kuntze (1903: 165). Type: Not designated.

*Shrubs* or rarely small trees, mostly scleromorphic, glabrous or sometimes hispid, tap-rooted or shortly rhizomatous. *Root anatomy* normal (unistellar), or with anomalous secondary thickening (‘cord’ roots: Pate *et al.*

1989), in which successive cambia arise outside the previous season's growth, resulting in overlapping arcs or separate strands of secondary xylem and phloem. In external view, cord roots have vertical flanges or a plaited ropy appearance. Cord root anatomy may develop late, so that an individual root section can have a central unistelar core with cord anatomy at the periphery, and a population can have a mixture of types, depending on the age of the plants. *Leaves* modified to phyllodes or reduced to scales, arranged spirally or rarely whorled, simple and entire or occasionally with 1 or 2 asymmetric lobes, smaller towards tips of branchlets, often pungent, often terete or vertically flattened; stipules minute or absent. *Unit inflorescence* a raceme, usually axillary, sometimes multiple, often modified to an umbel, cluster or single flower, terminated by an anauxotelic vegetative bud and just below it an aborting floral bud; several barren bracts present on peduncle, sometimes enlarged into an involucre; flower articulate on pedicel; bracteoles absent. *Calyx* campanulate, contracted at base to a stipe-like receptacle; lobes 5, shorter than tube; upper 2 usually broader and  $\pm$  connate. *Corolla* yellow or orange (red), usually with darker reddish markings; standard usually reflexed and  $\pm$  orbicular; wings usually apically incurved, overlapping and embracing the keel; keel  $\pm$  incurved, often beaked,  $\pm$  cohering along abaxial margins, sometimes abaxially rugose. *Stamens* 10, incurved, all free or lightly (rarely strongly) cohering,  $\pm$  overlapping; outer whorl of 5 filaments compressed to flattened, usually shorter than inner whorl of 5 ca. terete filaments; anthers dimorphic, alternately large and basifixed (outer whorl), and small and usually versatile (inner whorl); inner anthers often with confluent thecae; filaments free; vexillary filament sometimes channelled adaxially or dilated distally. *Ovary* and style glabrous; style incurved; stigma terminal, minute; ovules 2. *Pod* compressed or turgid, obliquely obtriangular in outline, often beaked, dehiscing elastically. *Seed* with a lateral hilum and a usually persistent aril that is lobed distally to the radicle.

Endemic to Australia with 131 species and 19 subspecies (not counting autonyms), totalling 150 taxa distributed throughout the continent, though more than half are restricted to the south-west.

*Daviesia* is a distinctive genus diagnosed by its unique unit inflorescence and pod. The inflorescence is an anauxotelic raceme (terminated by a non-developing vegetative bud), with the uppermost floral bud aborting, and a series of sterile bracts on the peduncle, tending to cluster at the base, and sometimes forming an involucre. The pod is obtriangular (with variations) and dehisces elastically to eject the seeds. Phyllode-like leaves are not unique to the genus—they are also seen in relatives *Erichsenia* and *Viminaria*—however, in these genera, the seedlings initially produce compound (sometimes unifoliolate) leaves, which are a relatively plesiomorphic type (Crisp & Weston 1987). In *Daviesia*, neither compound nor even simple leaves (as seen in the rest of Mirbelieae) are found in seedlings or adults. Moreover, the phyllodes of *Daviesia* are modified into a wide variety of forms, some of them bizarre.

### Key to the Species and Subspecies of *Daviesia*

- |        |   |                            |
|--------|---|----------------------------|
| 1.     | Leaves all reduced to non-spinose scales.....   | 43.                        |
| -      | At least some phyllodes developed (some or many nodes might bear scale-leaves or spines) .....  | 2.                         |
| 2(1).  | Phyllodes pungent at apex.....  | 59.                        |
| -      | Phyllodes often mucronate but not pungent.....  | 3.                         |
| 3(2).  | Phyllodes terete or compressed to flattened vertically (i.e. having adaxial and abaxial edges) .....  | 55.                        |
| -      | Phyllodes compressed or flattened horizontally (i.e. leaf-like, flattened at right angles to the branchlet).....                                | 4.                         |
| 4(3).  | Branchlets unarmed (phyllodes might be spinose).....  | 6.                         |
| -      | Branchlets spinose (check that spines are not actually reduced phyllodes, i.e. lateral) .....   | 5.                         |
| 5(4).  | Phyllodes always present, narrowly obovate, up to 20 mm long (WA).....  | 12. <i>D. bursarioides</i> |
| -      | Phyllodes often absent on upper parts of plant, mostly linear-elliptic, up to 120 mm long (WA).....   | 80. <i>D. horrida</i>      |
| 6(4).  | Phyllodes twisted into a corkscrew shape (WA) .....   | 33. <i>D. spiralis</i>     |
| -      | Phyllodes not or scarcely spirally twisted.....   | 7.                         |
| 7(6).  | Branchlets terete or, if angular, with 4 or more angles or ribs .....   | 13.                        |
| -      | Branchlets triquetrous, winged to angular (often becoming terete with growth) .....   | 8.                         |
| 8(7).  | Branchlets winged; phyllodes mostly reduced to scales; subtending bracts fimbriate (NSW) .....  | 43. <i>D. alata</i>        |
| -      | Branchlets angular; phyllodes present over whole plant; subtending bracts not fimbriate .....   | 9.                         |
| 9(8).  | Unit inflorescence an umbel; petals yellow or orange with dark red or purple markings .....   | 12.                        |
| -      | Unit inflorescence racemose, sometimes umbelliform at apex, or aggregating into panicles; petals yellow, reddish markings faint or absent ..... | 10.                        |
| 10(9). | Phyllodes usually emarginate; calyx covered with minute white dots; receptacle about as long as body of calyx (WA).....                         | 104. <i>D. emarginata</i>  |

- Phyllodes rarely emarginate; calyx not covered with white dots; receptacle distinctly shorter than body of calyx ..... 11.
- 11(10). Phyllodes to 15 mm broad; unit inflorescence sometimes umbelliform at apex, rachis 10–40 mm long; calyx 3–3.5 mm long including receptacle, not accrescent in fruit (Qld).....45. *D. flava*
- Phyllodes 1–6 mm broad; unit inflorescence strictly a raceme, rachis 10–80 mm long; calyx 5.5–7 mm long including receptacle, enlarging in fruit (WA, NT) ..... 11. *D. reclinata*
- 12(9). Calyx accrescent in fruit, viscid; lobes acuminate, recurved at tips; peduncles 3–7 mm long; pedicels 2–5 mm long; pod 9–13 mm long (SA)..... 6. *D. stricta*
- Calyx not enlarging significantly in fruit, not viscid; lobes acute, not or scarcely recurved; peduncles 7–28 mm long; pedicels 7–15 mm long; pod 7–10 mm long (Qld, NSW, Vic.) .....7. *D. wyattiana*
- 13(7). Unit inflorescence umbelliform; flowers subtended by an involucre of bracts 3–20 mm long; involucral bracts enlarging considerably to enclose pods, becoming scarious or coriaceous (*D. cordata* group) ..... 14.
- Unit inflorescence not umbelliform, or if so, then bracts not as above ..... 19.
- 14(13). Bracts and phyllodes linear-elliptic (WA).....20. *D. elongata*
- Bracts ± orbicular; phyllodes ovate, obovate or elliptic, broad to narrow, rarely linear..... 15.
- 15(14). Phyllodes tapered to rounded at base ..... 17.
- Phyllodes cordate to sagittate at base..... 16.
- 16(15). Phyllodes ovate or narrowly ovate, 50–150 mm long, often sagittate at base, tapered to a long acute apex (WA) ..... 23. *D. cordata*
- Phyllodes very broadly ovate to orbicular, 8–25 mm long, cordate at base, obtuse or scarcely acute and somewhat acuminate at apex (WA) ..... 24. *D. crenulata*
- 17(15). Phyllodes broadest at or below the middle; involucral bracts 6–10 mm long at anthesis, much shorter than flowers (WA).....25. *D. ovata*
- Phyllodes broadest at or above middle; involucral bracts 12–22 mm long at anthesis, enclosing flowers ..... 18.
- 18(17). Involucral bracts undulate but essentially planar, minutely pubescent at anthesis (WA) .....21. *D. alternifolia*
- Involucral bracts concavo-convex, glabrous (WA)..... 22. *D. oppositifolia*
- 19(13). Phyllodes articulate at base, sometimes linear but rarely angular or terete in cross-section ..... 24.
- Phyllodes lacking an articulation at base, linear and often angular or terete in cross-section ..... 20.
- 20(19). Bracts to 3 mm long and 2 mm broad, cupped, imbricate and concealing rachis of inflorescence (WA) ..... 87a. *D. debilior* subsp. *debilior*
- Bracts < 1.5 mm long and < 1 mm broad, subulate, neither imbricate nor concealing rachis..... 21.
- 21(20). Phyllodes with 1 or more longitudinal nerves between midrib and margin, or when < ca. 2 mm broad, oblong or terete in cross-section, with 6 or more ribs ..... 23.
- Phyllodes lacking longitudinal nerves between midrib and margin, or when < ca. 2 mm broad, diamond-shaped in cross-section, with 4 ribs, one at each angle ..... 22.
- 22(21). Calyx including receptacle 3.5–5 mm long, prominently 10-ribbed; lobes subequal (WA)..... 18. *D. costata*
- Calyx including receptacle 5.5–7 mm long, not ribbed; upper 2 lobes united into a truncate lip, lower 3 shorter, acute (WA)..... 19. *D. implexa*
- 23(21). Calyx with upper 2 lobes curved away from each other, larger than lower 3; unit inflorescence 4–11-flowered, rachis (4–)6–45(–150) mm long (WA) ..... 16. *D. longifolia*
- Calyx with all lobes alike, not curved; unit inflorescence 1–3(4)-flowered, rachis 1–12 mm long (WA) ..... 17. *D. pauciflora*
- 24(19). Bracts caducous (WA)..... 83. *D. rubiginosa*
- Bracts persistent ..... 25.
- 25(24). Calyx including receptacle ≤ 6 mm long at anthesis, not significantly enlarged in fruit; upper 2 lobes usually much broader and united higher than lower 3 ..... 27.
- Calyx including receptacle 7–8 mm long at anthesis, much enlarged in fruit; lobes alike, acuminate ..... 26.
- 26(25). Phyllodes green, 5–12 mm broad; unit inflorescences 1(2)-flowered (WA) ..... 81. *D. megacalyx*
- Phyllodes glaucous, 10–65 mm broad; unit inflorescences 2- or 3-flowered (WA) .....82. *D. obovata*
- 27(25). Plants prostrate or procumbent; phyllode apex acuminate or cuspidate, semi-pungent; inflorescence a 2–4(5)-flowered umbel; pedicel dilated upwards, with an annular thickening at the apex (WA)..... 31. *D. lancifolia*
- Not the above combination ..... 28.
- 28(27). Flowers per unit inflorescence (3–)5–many ..... 32.
- Flowers per unit inflorescence 1–3(4) (note: a unit inflorescence is recognised by the cluster of vacant bracts at the base of the peduncle; there may be > 1 per axil) ..... 29.
- 29(28). Flowers per unit inflorescence 1; phyllode margins thickened; calyx lightly 5-ribbed ..... 31.
- Flowers per unit inflorescence mostly 2 or 3; phyllode margins not thickened; calyx not ribbed ..... 30.
- 30(29). Phyllodes (30–)40–100 mm long (NSW) ..... 46. *D. suaveolens*
- Phyllodes 7–25(–35) mm long (WA) ..... 67. *D. argillacea*
- 31(29). Calyx including receptacle 3.0–3.5 mm long, upper 2 lobes similar to lower 3, united scarcely higher; stipules present, 0.5–1 mm long (WA)..... 41. *D. grahamii*

- Calyx including receptacle 4.8–5.6 mm long, upper 2 lobes united into a deeply notched lip; stipules present but minute, ca. 0.1 mm long (WA)..... 42. *D. newbeyi*
- 32(28). Phyllodes linear-elliptic, 5–20 cm long, tapered to a long acute apex, discolorous, thin in texture; secondary veins dense, fine but conspicuous, ± longitudinal and anastomosing ..... 33.
- Not the above combination ..... 34.
- 33(32). Tall shrubs or small trees with corky bark; racemes 8–15-flowered, rachis 10–27 mm long (Qld, NSW) ..... 54. *D. arborea*
- Shrubs to 2 m without corky bark; racemes 3–8-flowered, rachis 5–10 mm long (Qld)..... 55. *D. discolor*
- 34(32). Bracts ± appressed, inconspicuous, 0.75–1(–2) mm long..... 37.
- Bracts spreading widely, conspicuous, (1–)2–4(–7) mm long ..... 35.
- 35(34). Unit inflorescence corymbose (NSW) ..... 44. *D. corymbosa*
- Unit inflorescence racemose ..... 36.
- 36(35). Phyllode margins crenulate; tertiary venation conspicuously reticulate; inflorescence rachis 25–80 mm long (Qld, NSW, Vic., Tas.)..... 51. *D. latifolia*
- Phyllode margins entire; tertiary venation obscure; inflorescence rachis 20–30(–80) mm long (Vic.) ... 53. *D. laevis*
- 37(34). Racemes 40–120 mm long (Vic.)..... 52. *D. laxiflora*
- Racemes < 25 mm long..... 38.
- 38(37). Phyllodes linear; slightly convex on adaxial face; venation with a raised longitudinal nerve near each margin (SA, NSW, Vic.) ..... 49. *D. leptophylla*
- Phyllodes ovate to obovate, often narrow but rarely linear, flat or undulate; venation pinnate or obscure..... 39.
- 39(38). Phyllodes entire (rarely shallowly crenate), dull to glaucescent; tapered to base or rarely cuneate; peduncles 0–5 mm long..... 41.
- Phyllodes crenulate (may be obscure), glossy, green; base cordate, rounded or cuneate; peduncles 3.5–15 mm long. .... 40.
- 40(39). Phyllodes ovate to orbicular, cordate to rounded at base (southern NSW, Vic.) ..... 47. *D. buxifolia*
- Phyllodes mostly elliptic or narrowly elliptic, cuneate to rounded at base (Qld, northern NSW) ..... 50. *D. elliptica*
- 41(39). Shrubs or trees to 6 m high; flowers strongly fragrant; lower calyx lobes 0.8–1 mm long, tips not thickened nor coloured (NSW) ..... 46. *D. suaveolens*
- Shrubs (rarely arborescent) to 3 m high; flowers usually not or scarcely fragrant; lower calyx lobes 0.3–0.6 mm long, tips thickened and tinged dark brown (Qld, NSW, Vic) (48. *D. mimosoides*)..... 42.
- 42(41). Phyllodes narrowly elliptic to obovate or linear, acute or obtuse at apex, tapered to base, not crenulate, dull green to glaucescent (Qld, NSW, Vic.) ..... 48a. *D. mimosoides* subsp. *mimosoides*
- Phyllodes obovate or elliptic, scarcely narrow, rounded or obtuse at apex, occasionally acute, cuneate at base, obscurely crenulate, glaucescent (NSW, Vic.) ..... 48b. *D. mimosoides* subsp. *acris*
- 43(1). Branchlets terete..... 47.
- Branchlets angular or flattened ..... 44.
- 44(43). Branchlets narrowly winged, triquetrous in cross-section ..... 46.
- Branchlets flat or biconvex in cross-section ..... 45.
- 45(44). Branchlets biconvex, < 5 mm broad, dull green; flowers < 1 cm long, yellow (WA) ..... 1. *D. anceps*
- Branchlets flattened, to 1–2 cm or broader, stag-horn-like, pruinose; flowers > 2 cm long, red (WA)..... 84. *D. epiphyllum*
- 46(44). Procumbent to prostrate shrubs; subtending bracts fimbriate (NSW) ..... 43. *D. alata*
- Erect shrubs; subtending bracts not fimbriate (WA) ..... 93. *D. pteroclada*
- 47(43). Terminal branchlets > 5 cm long, erect or ascending and not or scarcely spinescent at apex ..... 50.
- Terminal branchlets short (2–5 cm), divaricate and fiercely spinescent ..... 48.
- 48(47). Bracts spreading or reflexed (WA)..... 80. *D. horrida*
- Bracts appressed to pedicels (WA) (14. *D. divaricata*)..... 49.
- 49(48). Calyx not woolly inside, though sometimes with a ring of short hairs inside the lobes, faintly 5-ribbed externally; upper 2 lobes united into a broad, truncate lip (S of Walkaway, WA) ..... 14a. *D. divaricata* subsp. *divaricata*
- Calyx with a conspicuous ring of woolly hairs inside the lobes and visible externally in the sinuses; upper 2 lobes not united in a truncate lip; prominently 5-ribbed externally (N of Walkaway, WA)..... 14b. *D. divaricata* subsp. *lanulosa*
- 50(47). Bracts imbricate and covering the inflorescence rachis, ≥ 2–5 mm long, striate..... 52.
- Bracts scattered so that inflorescence rachis is clearly visible, ≤ 1 mm long, smooth ..... 51.
- 51(50). Habit broom-like, with erect or ascending branchlets, often in fascicles; branchlets striate when dry, 0.75–1.25 mm diam.; all phyllodes reduced to scales; raceme with 1–3(4) flowers; subtending bracts ca. 1 mm long, ≥ pedicels (WA)..... 68. *D. scoparia*
- Habit open and divaricate; branchlets obscurely wrinkled when dry, 1.5–2.5 mm diam.; usually 1 or 2 short spinose phyllodes present at some branchlet tips on the plant; raceme with (3)4 or more flowers; subtending bracts ca. 0.5 mm long, ≤ pedicels (WA, SA) ..... 74. *D. aphylla*
- 52(50). Calyx ca. 1.5 mm long, with very shallow, obtuse lobes; usually a few slender, pungent, 1–5 mm-long phyllodes

- scattered over branchlets (WA) .....91b. *D. hakeoides* subsp. *subnuda*
- Calyx 2–3 mm long, with distinct acuminate lobes (at least the lower 3); phyllodes all reduced to scales ..... 53.
- 53(52). Inflorescences all 3-flowered; receptacle at base of calyx truncate, 2x diam. of pedicel (WA) ..... 89. *D. triflora*
- Inflorescences with a variable number of flowers (2–4 or 3–5); receptacle tapered to pedicel..... 54.
- 54(53). Calyx-lobes with dark grey tips, upper 2 united in a truncate emarginate lip; standard 6–6.5 mm broad (WA).....
- .....87b. *D. debilior* subsp. *sinuans*
- Calyx-lobes with yellow-green tips, upper 2 free, triangular, separated by a 0.75 mm sinus; standard 9–10 mm broad (WA)..... 88. *D. gracilis*
- 55(3). Phyllodes disarticulating from branchlets with age, 20–40 mm long (WA).....69. *D. nematophylla*
- Phyllodes continuous with branchlets, not articulate at the base, at least the lower ones >> 40 mm long..... 56.
- 56(55). Bracts caducous; stems lightly pruinose, becoming reddish or purplish with age (WA)..... 83. *D. rubiginosa*
- Bracts persistent; stems sometimes glaucous but not also reddish or purplish..... 57.
- 57(56). Phyllodes smooth when fresh, wrinkled-striate when dry; racemes resembling clusters in axils; subtending bracts conspicuous, shell-shaped, imbricate and enclosing rachis (WA) ..... 90. *D. pseudaphylla*
- Phyllodes with 4 or more prominent longitudinal ribs; racemes open, rachis clearly visible and not enclosed by involucre bracts; subtending bracts minute..... 58.
- 58(57). Phyllodes tetragonous in cross-section, with one rib at each angle and no other visible venation; standard cordate at the base (WA)..... 18. *D. costata*
- Phyllodes terete or somewhat oblong in cross-section, with 6 or more ribs; standard truncate at the base (WA) .....
- ..... 16. *D. longifolia*
- 59(2). Phyllodes basally articulate at the branchlet..... 97.
- Phyllodes continuous with the branchlet (rarely with node-like thickenings on midrib and marginal nerves at the base) ..... 60.
- 60(59). Cactus-like subshrubs with erect, terete, thick (6–10 mm diam.) cladodes, appearing fleshy but filled with pith; phyllodes reduced to scattered spines 0.5–2.5 mm long (WA).....130. *D. euphorbioides*
- Not as above..... 61.
- 61(60). Phyllodes horizontally flattened or compressed, i.e. leaf-like (a decurrent vertical rib or wing may also be present) .
- ..... 92.
- Phyllodes terete, or vertically compressed or flattened ..... 62.
- 62(61). Phyllodes terete ..... 72.
- Phyllodes compressed or flattened in the vertical plane (i.e. having adaxial and abaxial edges)..... 63.
- 63(62). Phyllodes concentrated near branchlet apex, spreading at 90°, subulate, very rigid, abruptly replaced by scale-leaves on lower part of branchlets; naked portion of branchlets terete (WA).....96b. *D. intricata* subsp. *xiphophylla*
- Arrangement of phyllodes not as above..... 64.
- 64(63). Phyllodes and/or branchlets striate, ribbed or ridged (sometimes winged), even when fresh ..... 67.
- Phyllodes and branchlets smooth when fresh, wrinkled or striate when dry, neither ribbed nor ridged ..... 65.
- 65(64). Phyllodes usually subulate and straight or slightly recurved, lower (juvenile) ones may be dilated; calyx 2.5–3.5 mm long including the receptacle; pod either compressed and small (< 7 mm long) or turgid and large (≥ 11 mm long) ..
- ..... 66.
- Phyllodes usually recurved (to hooked) and with upper margin dilated, seldom subulate and straight; calyx 4–5 mm long including the receptacle; pod compressed, 7–8 mm long (WA) ..... 101. *D. dilatata*
- 66(65). Keel with a ca. 2 mm subulate beak and a minute hook at the apex; pod turgid, rounded-obtriangular in outline, 11–14 mm long (WA) ..... 108a. *D. incrassata* subsp. *incrassata*
- Keel scarcely acute and neither beaked nor hooked; pod compressed, obliquely shallowly obtriangular in outline, ca. 5 mm long (WA) ..... 70. *D. subulata*
- 67(64). Branchlets trigonous to triquetrous with decurrent ridges from phyllode bases; phyllodes straight, incurved or recurved..... 69.
- Branchlets terete or oval (rounded-trigonous immediately below phyllode bases); phyllodes hooked ..... 68.
- 68(67). Branchlets straight; phyllodes 2–10(–15) mm long; flowering July to September (WA) .....95b. *D. decurrens* subsp. *hamata*
- Branchlets flexuose; phyllodes (5–)20–70 mm long; flowering November to January (WA) .....102. *D. uncinata*
- 69(67). Bracts with striations visible under a hand-lens; phyllodes striate when fresh (WA).....
- .....95a. *D. decurrens* subsp. *decurrens*
- Bracts not striate, minute; phyllodes smooth or with a single eccentric rib when fresh, wrinkled-striate when dry ....
- ..... 70.
- 70(69). Phyllodes with a fine, conspicuous, pale rib 0.5–1 mm below upper margin; pod compressed, ≤ 10 mm long (SA, Vic.).....65. *D. pectinata*
- Phyllodes lacking a rib, or if present, then rib obscure and not differing in colour from rest of phyllode; pod either inflated or compressed and 15–20 mm long ..... 71.
- 71(70). Receptacle tapered evenly to petiole; calyx evenly ciliate around margins; pod strongly compressed, purple-spotted, 15–20 mm long (WA) ..... 98. *D. flexuosa*

- Receptacle truncate and greater in diam. than petiole; ciliae present only at tips of calyx-lobes; pod inflated, thick-walled, evenly red-brown or purplish, ca. 12 mm long (WA) ..... 99. *D. decipiens*
- 72(62). Flowers  $\geq 20$  mm long, uniformly red; plant pruinose; phyllodes terete, robust and resembling branchlets, mostly 3–8 cm long, ca. 2 mm diam. (WA) ..... 85. *D. speciosa*
- Flowers  $\leq 12$  mm long, a combination of yellow or orange and dark red; plant pruinose or not; phyllodes (if terete)  $\leq 1.5$  mm diam ..... 73.
- 73(72). Bracts usually not striate, upper ones  $\leq$  ca. 1 mm long; lower bracts not conspicuously imbricate nor covering rachis ..... 79.
- Bracts striate, upper ones 2–3 mm long; lower bracts conspicuously imbricate, covering rachis ..... 74.
- 74(73). Branchlets striate with multiple fine ribs; phyllodes  $\leq 1.5$  mm diam., ascending or spreading at right angles ..... 76.
- Branchlets smooth, or longitudinally wrinkled when dry; phyllodes very robust (1–2 mm diam.), spreading at right angles or even somewhat retrorse (WA) (94. *D. sarissa*) ..... 75.
- 75(74). Bracts subtending pedicels imbricate and concealing inflorescence at anthesis, 3–5 mm long, 2–3 mm broad, striate with many prominent ribs; pedicels 0.5–1.5 mm long; calyx including receptacle ca. 2.5 mm long; standard ca. 5.5 mm broad (WA) ..... 94a. *D. sarissa* subsp. *sarissa*
- Bracts subtending pedicels neither imbricate nor concealing inflorescence, 1.5–2 mm long, 0.75–1 mm broad, inconspicuously striate with few ribs; pedicels 1.5–3 mm long; calyx including receptacle ca. 3.5 mm long; standard ca. 6.5 mm broad (WA) ..... 94b. *D. sarissa* subsp. *redacta*
- 76(74). Bracts subtending pedicels reflexed, 4–5 mm long; calyx-lobes acuminate, each with a pale stripe; standard ca. 12 mm broad; pod 13–14 mm long, viscid (WA) ..... 86. *D. major*
- Bracts subtending pedicels ascending or spreading,  $\leq 3$  mm long; standard  $< 10$  mm broad; pod smaller, not viscid. .... 77.
- 77(76). Stems pruinose, especially towards the base; calyx-lobes well-developed, acute or acuminate (WA) ..... 92. *D. smithiorum*
- Stems greyish but not pruinose; calyx-lobes very shallow, obtuse (WA) (91. *D. hakeoides*) ..... 78.
- 78(77). Phyllodes well-developed, conspicuous, 10–50 mm or longer (WA) ..... 91a. *D. hakeoides* subsp. *hakeoides*
- Phyllodes inconspicuous, 1–5(–10) mm long, often reduced to scales over most of the plant, but detectable by their pungent feel (WA) ..... 91b. *D. hakeoides* subsp. *subnuda*
- 79(73). Phyllodes and branchlets neither ribbed nor striate when fresh, longitudinally wrinkled when dry ..... 83.
- Phyllodes and branchlets striate, at least when dry ..... 80.
- 80(79). Branchlets straight; phyllodes inconspicuous, 2–8 mm long; standard with a bilobed, V-shaped central yellow marking (WA) ..... 15. *D. localis*
- Branchlets flexuose; phyllodes conspicuous, 4–50 mm or longer; central yellow marking on standard narrowly oblong, not V-shaped ..... 81.
- 81(80). Calyx including receptacle ca. 2 mm long; keel ca. 3 mm long, scarcely acute; vexillary filament channelled and flared at apex (WA) ..... 96a. *D. intricata* subsp. *intricata*
- Calyx including receptacle 2.5–5 mm long; keel 5.5–8 mm long, tapered and very acute to acicular; vexillary filament terete and not flared at apex ..... 82.
- 82(81). Plants multi-stemmed and tufted but not rhizomatous; phyllodes ascending, uncinata; inflorescence 2–several-flowered (WA) ..... 102. *D. uncinata*
- Plants in tufts arising from lignotubers and spreading by rhizomes to form extensive colonies; phyllodes patent to retrorse, straight or gently recurved at apex; inflorescence strictly 1-flowered (WA) ..... 131. *D. rhizomata*
- 83(79). Pod compressed or turgid, thin-walled, to 7 mm long, apiculate but not beaked; inner whorl of 5 stamens with anther thecae confluent; outer portion of standard yellow to orange ..... 87.
- Pod very turgid, thick-walled,  $\geq 12$  mm long, tapered to an acuminate beak; inner whorl of 5 of stamens with anthers 2-celled, except confluent in the vexillary stamen; outer portion of standard orange to red ..... 84.
- 84(83). Phyllodes short (mostly 1–3 mm long), oblique, broadest near the middle and constricted above and below it (SA, Vic.) ..... 106. *D. brevifolia*
- Phyllodes variable, mostly 5–20 mm long, straight or recurved, broadest near the base, juvenile phyllodes with a dilated upper margin towards the apex (WA) (108. *D. incrassata*) ..... 85.
- 85(84). Branchlets zigzag with phyllodes retrorse or spreading at right angles (WA, possibly also SA) ..... 108b. *D. incrassata* subsp. *reversifolia*
- Branchlets straight or somewhat flexuose with phyllodes ascending ..... 86.
- 86(85). Phyllodes all terete, even at base of plant (WA) ..... 108c. *D. incrassata* subsp. *teres*
- Phyllodes vertically compressed or dilated towards base of plant, sometimes all over the plant (WA) ..... 108a. *D. incrassata* subsp. *incrassata*
- 87(83). Epidermis of phyllodes and branchlets smooth ..... 88.
- Epidermis of phyllodes and branchlets minutely scabrid (WA) ..... 77. *D. scabrella*
- 88(87). Phyllodes and branchlets glaucous to purplish; pod turgid, not dehiscing elastically (WA, SA) .. 71. *D. purpurascens*
- Phyllodes and branchlets dull- or yellow-green, occasionally glaucescent; pod compressed, dehiscing elastically .... 89.

- 89(88). Minute (< 1 mm) narrowly triangular stipules present at base of phyllodes (SA, NSW, Vic.).....79. *D. devito*  
 - Stipules absent..... 90.
- 90(89). Phyllodes developed only at uppermost 0–6(–8) nodes of each seasonal branchlet, reduced to scales at lower nodes,  
 0–15(–25) mm long, diverging at ca. 90° or nearly so (WA, SA).....74. *D. aphylla*  
 - Phyllodes well developed, usually 6–many along upper 2/3 (at least) of each seasonal branchlet, reduced to scales  
 only in lower third (or less) of branchlet, (10–)15–50(–100) mm long, diverging at 45–60° (in *D. benthamii*) or ca.  
 90° (in *D. schwarzenegger*) ..... 91.
- 91(90). Plants with an open crown and usually higher than wide, not suckering from roots; phyllodes (10–)20–100 mm long,  
 lengthening at successively lower nodes until abruptly reduced to scales in lower ca. 1/3 of branchlet (WA) .....  
 .....72. *D. benthamii*  
 - Bushy plants, spreading by suckering from roots and usually wider than high; phyllodes 10–25(–35) mm long, not  
 or scarcely increasing in length down the branchlet and replaced by scales only near the branchlet base (SA, NSW,  
 Vic.).....73. *D. schwarzenegger*
- 92(61). Phyllodes triquetrous in cross-section, decurrent into a broad wing running down the branchlet (WA) .....  
 .....100. *D. trigonophylla*  
 - Phyllodes not triquetrous; branchlets not winged ..... 93.
- 93(92). Phyllodes ± appressed to branchlet, obovate, with an outwardly bent apical cusp; branchlets hirsute, midrib and margins  
 of phyllodes with a few stiffly spreading hairs (WA)..... 34. *D. uniflora*  
 - Phyllodes ascending to widely spreading, lanceolate, ovate, elliptic or obovate, apical cusp seldom bent back; plants  
 entirely glabrous or (in subsp. *hirtella*) sparsely hispid on branchlets (WA) (40. *D. nudiflora*) ..... 94.
- 94(93). Phyllodes concentrated near branchlet apex, with scale-leaves present at lower nodes; flowers mostly in axils of  
 scale-leaves ..... 96.  
 - Phyllodes evenly distributed along branchlets ..... 95.
- 95(94). Phyllodes spreading at 60–90°, heart-shaped and stem-clasping at the base, smooth, glaucous to pruinose; pods 7–9  
 mm broad (WA) .....40b. *D. nudiflora* subsp. *amplectens*  
 - Phyllodes ascending at 0–30(–45)°, ovate or elliptic and usually narrow, tapered to the base, yellow-green to glau-  
 cous, minutely scabrid; pods 5–6 mm broad (WA)..... 40c. *D. nudiflora* subsp. *drummondii*
- 96(94). Phyllodes obovate to ovate, broad to narrow, ascending or spreading, flat or somewhat folded upwards; nerves not  
 thickened at base; plants entirely glabrous (WA)..... 40a. *D. nudiflora* subsp. *nudiflora*  
 - Phyllodes broad-elliptic, folded upwards and spreading widely; the three nerves thickened at junction with branch-  
 let; branchlets and phyllode margins often hispid (WA)..... 40d. *D. nudiflora* subsp. *hirtella*
- 97(59). Phyllodes terete ..... 99.  
 - Phyllodes compressed or flattened..... 98.
- 98(97). Phyllodes vertically compressed or flattened, i.e. with adaxial and abaxial edges..... 116.  
 - Phyllodes horizontally compressed or flattened, i.e. with adaxial and abaxial surfaces ..... 133.
- 99(97). Phyllodes neither appearing succulent nor filled with pith, 0.5–2.5 mm diam ..... 101.  
 - Phyllodes appearing succulent but filled with pith, (2–)3–6 mm diam ..... 100.
- 100(99). Phyllodes pruinose, spreading at right angles, cylindrical and not tapered to base; petals yellow and maroon (WA)..  
 ..... 129. *D. pachyphylla*  
 - Phyllodes dull green, erect, clavate (tapered to the base); petals pure yellow (WA)..... 128. *D. crassa*
- 101(99). Phyllodes often striate but otherwise smooth ..... 104.  
 - Phyllodes minutely scabrous ..... 102.
- 102(101). Phyllodes resembling caterpillars, crowded, ascending at ca. 45°, gently curved, either sigmoid or irregular; apex  
 asymmetric, dilated upwards, with pungent point deflexed (WA)..... 75. *D. campephylla*  
 - Phyllodes needle-like, well-spaced, spreading at 60–90°, straight or gently recurved, tapered to a symmetrical point  
 ..... 103.
- 103(102). Flowers in short erect racemes; petals yellow with red markings; standard very broad-ovate, much broader than  
 keel; stamens enclosed in keel at anthesis (WA).....76. *D. articulata*  
 - Flowers pendulous in umbelliform racemes; petals maroon; standard scarcely broader than keel, tongue-like;  
 anthers exposed at anthesis (WA) ..... 111. *D. glossosema*
- 104(101). Phyllodes ± erect, giving the plant a ‘broombush’ appearance; phyllodes 2–10 cm or longer ..... 111.  
 - Phyllodes spreading at 45–90° or more, the plant usually divaricate in appearance; many or most phyllodes < 2 cm  
 long..... 105.
- 105(104). Flowers solitary, very small (3–4 mm long); pods ca. 4 mm long; nodes crowded (2.5–3.5 per cm) (WA) .....  
 ..... 3. *D. microcarpa*  
 - Flowers 2 or more per unit inflorescence, 5 mm or longer; pods > 7 mm long; nodes < 2 per cm ..... 106.
- 106(105). Flowers 5–7 mm long ..... 108.  
 - Flowers 9–10 mm long ..... 107.
- 107(106). Phyllodes spreading at 45–60(–90)°, gently uncinatate; stems and branchlets ascending (WA) ..... 110. *D. inflata*  
 - Phyllodes spreading at 90° or more (retorse), not recurved at tips; branchlets divaricate and recurved, so that plant  
 is very tangled and intricate (WA) ..... 114. *D. ramosissima*



- 108(106). Keel  $\pm$  obtuse; pod strongly compressed; phyllodes and branchlets striate with multiple ribs when dry; phyllodes present over the whole plant ..... 110.
- Keel acute or beaked; pod moderately to very turgid; phyllodes and branchlets longitudinally wrinkled when dry; phyllodes often reduced to scales over much of the plant ..... 109.
- 109(108). Phyllodes at 45–90°; keel constricted to a sharply incurved beak; pod very turgid, 10–12 mm long (WA) ..... 107. *D. brachyphylla*
- Phyllodes spreading at 90° or more (retrorse); keel acute; pod moderately turgid, 9–10 mm long (WA) ..... 97. *D. retrorsa*
- 110(108). Rachis of raceme 0–6 mm long; upper 2 calyx-lobes united in a truncate emarginate lip (SA, Qld, NSW, Vic.) ..... 78. *D. genistifolia*
- Rachis of raceme 5–12 mm long; calyx-lobes all similar, acuminate (WA) ..... 13. *D. pleurophylla*
- 111(104). Pedicels (excluding stipe-like receptacle) 4–10 mm long ..... 113.
- Pedicels 1–3 mm long ..... 112.
- 112(111). Upper 2 calyx-lobes fully united into a truncate or obtuse lip; phyllodes with a pungent apical mucro 0.5–1 mm long; pod compressed; flowering November to March (WA) ..... 115. *D. apiculata*
- Upper 2 calyx-lobes  $\pm$  equal to lower 3; phyllodes with an acicular tip 2–3 mm long; pod turgid; flowering July to August (WA) ..... 64. *D. oxylobium*
- 113(111). Phyllodes glaucous to pruinose, longitudinally ribbed, 1.25–2.5 mm diam ..... 115.
- Phyllodes dull- or yellow-green, smooth or longitudinally wrinkled or very finely striate, 0.75–1 mm diam ..... 114.
- 114(113). Phyllodes smooth or longitudinally wrinkled when dry; pods thin-walled, ca. 7 mm long, obtuse or scarcely acute (NT) ..... 66. *D. eremaea*
- Phyllodes very finely striate even when fresh; pods coriaceous, ca. 20 mm long, tapered to a long pungent beak (WA) ..... 27. *D. lineata*
- 115(113). Phyllodes 1.25–1.5 mm diam.; flowers 7–10 mm long; pods 12–15 mm long; flowering June to October (WA) ..... 116. *D. teretifolia*
- Phyllodes 2–2.5 mm diam.; flowers 15–20 mm long; pods 15–20 mm long; flowering December to April (WA) ..... 117. *D. grossa*
- 116(98). Stipules clearly present, ca. 1 mm long, subulate, recurved; calyx-lobes subulate, equal to or longer than the tube; plant procumbent to prostrate; phyllodes linear (WA) ..... 2. *D. pachyloma*
- Stipules absent; calyx-lobes shorter (usually much shorter) than the tube; plant erect or spreading (except *D. meso-phylla*); phyllode shapes various ..... 117.
- 117(116). Phyllodes often asymmetrically lobed but never with > 1 pungent apex ..... 119.
- Phyllodes 3- or 4-sided, with 2 pungent apices at either end of the abaxial edge ..... 118.
- 118(117). Branchlets angular and never spinescent; phyllodes sessile, adnate to the branchlet by a base 1.5–4 mm broad; unit inflorescences umbelliform with a robust, 5–12 mm long peduncle + rachis, with 3–6 flowers on pedicels 1–4 mm long (WA) ..... 113. *D. quadrilatera*
- Branchlets terete, often terminated by a spine; phyllodes contracted at the base to a 1–2 mm long stipe resembling a petiole; unit inflorescences with a very short peduncle + rachis 1(–3) mm long, with 1 or 2(3) flowers on pedicels 2–4 mm long (WA) ..... 112. *D. podophylla*
- 119(117). Phyllodes and branchlets smooth (except the ribs when present) or (in *D. dielsii*) tomentose ..... 122.
- Phyllodes and branchlets minutely scabrous ..... 120.
- 120(119). Phyllodes resembling caterpillars: clavate, asymmetrically thickened or lobed at the apex so that the pungent point is oblique, longitudinally wrinkled when dry but not striate (WA) ..... 75. *D. campephylla*
- Phyllodes subulate to falciform, not apically thickened, longitudinally striate when fresh (SA) (63. *D. asperula*) ..... 121.
- 121(120). Phyllodes subulate, broadest at or near the base (SA) ..... 63a. *D. asperula* subsp. *asperula*
- Phyllodes falciform or obliquely narrow-obovate, broadest at or above the middle (SA) ..... 63b. *D. asperula* subsp. *obliqua*
- 122(119). Branchlets and usually the phyllodes minutely tomentose with recurved hairs; phyllodes obliquely obovate, 2–4 mm long (WA) ..... 121. *D. dielsii*
- Plants entirely glabrous; phyllodes usually  $\geq$  5 mm long ..... 123.
- 123(122). Phyllodes entire, although often asymmetric by slight dilation of the upper margin; plants green, glaucous or pruinose ..... 125.
- At least the lower phyllodes bilobed by dilation of the upper margin, with a shallow sinus between the lobe and deflexed pungent tip, sometimes obtriangular (upper phyllodes usually not lobed but merely asymmetric); plants  $\pm$  pruinose ..... 124.
- 124(123). Branchlet apex spinescent (WA) ..... 120. *D. oxyclada*
- Branchlet apex not spinescent (WA) ..... 109. *D. physodes*
- 125(123). Pods thin-walled, compressed, scarcely acute; anthers of all 5 stamens in inner whorl with thecae confluent; phyllodes subulate (Vic., NSW) ..... 78. *D. genistifolia*
- Pods coriaceous, turgid, pungently beaked; anther thecae confluent only in vexillary stamen; phyllodes subulate or

	other shapes (WA).....	126.
126(125).	Branchlets angular with sharp raised ridges, at least when dry .....	129.
-	Branchlets smooth when fresh, longitudinally wrinkled when dry .....	127.
127(126).	Phyllodes crowded with bases overlapping along branchlets.....	128.
-	Phyllodes scattered with bases not overlapping along branchlets (WA) .....	124. <i>D. preissii</i>
128(127).	Plants glaucous to pruinose; phyllodes obliquely oblong-elliptic, (3–)4–6.5 mm broad, without thickened bases (WA).....	126. <i>D. striata</i>
-	Plants often grey-green but not glaucous; phyllodes subulate, 1.5–3(–4) mm broad, with thickened bases (WA).....	125. <i>D. spinosissima</i>
129(126).	Phyllodes ca. 5 mm long, oblong-elliptic, spreading ± at right angles to branchlet, often retrorse; branchlets divaricate, short (2–5 cm long), usually terminated by a spine (WA).....	119. <i>D. microphylla</i>
-	Phyllodes mostly > 5 mm long, oblong, linear or subulate, usually ascending, sometimes at right angles, but never retrorse; branchlets mostly ascending and > 5 cm long, never spinescent .....	130.
130(129).	Phyllodes very crowded with bases manifestly overlapping along branchlets, (2.5–)3–4 mm broad, oblong to deltoid, or narrowly so, often falcate (WA) .....	127. <i>D. chapmanii</i>
-	Phyllodes not or scarcely overlapping, 1–2.5 mm broad, shaped as above or linear, or subulate .....	131.
131(130).	Plants procumbent or prostrate; pedicels 5–8 mm long (WA) .....	118. <i>D. mesophylla</i>
-	Plants erect; pedicels 1–4 (5) mm long .....	132.
132(131).	Outer part of standard pure yellow; pedicels 2–4(5) mm long; racemes 2–4-flowered; rachis 1–3 mm long; flowering March to July (WA) .....	123. <i>D. angulata</i>
-	Outer part of standard pinkish yellow or orange; pedicels 1–2 mm long; racemes 1- or 2-flowered; rachis absent; flowering July to September (WA) .....	122. <i>D. polyphylla</i>
133(98).	Calyx manifestly zygomorphic, with upper 2 lobes ± united into a lip .....	144.
-	Calyx-lobes ± equal .....	134.
134(133).	Growth habit not divaricate; branchlets not spinescent; phyllodes with margins strongly recurved to revolute, bearing scattered minute teeth (NSW, Qld) .....	5. <i>D. acicularis</i>
-	Growth habit divaricate; all or most branchlets terminating in a spine; phyllodes often concave below but margins not or scarcely recurved, lacking teeth.....	135.
135(134).	Adaxial surface of phyllode convex or nearly flat, with midrib more prominent than on abaxial surface; phyllodes variously shaped but never cordate; plants usually glabrous, or rarely hispid on branchlets, midrib and margins of phyllodes .....	136.
-	Phyllodes somewhat folded upwards with a groove along the centre of the adaxial face, with midrib prominent on abaxial face; phyllodes commonly cordate, occasionally tapered to base; plants grey-hispid, rarely glabrous (on deep sand in mallee districts of SA, NSW, Vic.).....	8. <i>D. arenaria</i>
136(135).	Calyx-lobes flat or keeled, slightly recurved from the base (obscured by pressing); phyllodes obovate or narrowly so, sometimes narrow-elliptic, often large (> 15 mm long and > 3 mm wide), secondary venation usually visible.....	143.
-	Calyx-lobes strongly keeled, incurved at the margins and in profile; phyllodes ovate, elliptic, narrow-elliptic or linear, if > 15 mm long then generally < 2–3 mm wide, secondary venation usually not visible (except subsp. <i>pilligensis</i> ) (all states except NT) (10. <i>D. ulicifolia</i> ).....	137.
137(136).	Unit inflorescence umbellate or shortly racemose .....	141.
-	Unit inflorescence 1-flowered, sometimes paired in the axils .....	138.
138(137).	Phyllodes narrow-elliptic or narrow-ovate to linear .....	140.
-	Phyllodes ± ovate, rarely narrow .....	139.
139(138).	Phyllodes convex above with midrib more prominent above than below; standard orange (fading to yellow with age); stems often hispid (on heavy-textured soils at moderate to high elevation in Vic., southern NSW and Tas.) .....	10c. <i>D. ulicifolia</i> subsp. <i>ruscifolia</i>
-	Phyllodes flat to concave above, or undulate, with midrib equal on both faces or more prominent below; standard yellow; stems always glabrous (on sand in SE Qld, NSW) .....	10d. <i>D. ulicifolia</i> subsp. <i>pilligensis</i>
140(138).	Phyllodes 9–20 mm long, 0.5–1(–1.5) mm wide, linear-elliptic to linear-ovate (Qld and northern NSW) .....	10b. <i>D. ulicifolia</i> subsp. <i>stenophylla</i>
-	Phyllodes either > 1 mm wide or < 9 mm long, narrow-elliptic to narrow-ovate (NSW, Vic.).....	10a. <i>D. ulicifolia</i> subsp. <i>ulicifolia</i>
141(137)	Standard yellow toward margins with red markings toward centre; plant dull green (south-east SA, Vic., NSW, Tas.) .....	10a. <i>D. ulicifolia</i> subsp. <i>ulicifolia</i>
-	Standard orange near margins, becoming red towards centre; plant glaucescent .....	142.
142(141).	Standard < 4.5 mm wide; inflorescence appearing umbellate though tending to shortly racemose; plants very divaricate, rigid and spiny (on sand in southern arid regions of WA, SA, and far south-west NSW) .....	10e. <i>D. ulicifolia</i> subsp. <i>aridicola</i>
-	Standard > 5 mm wide; inflorescence strictly umbellate; plants usually open and spreading (various soils, restricted to the Mt Lofty and Flinders Ranges, and Kangaroo Island, SA).....	10f. <i>D. ulicifolia</i> subsp. <i>incarnata</i>

- 143(136). Calyx-lobes 0.75–1.5 mm long; phyllodes dull dark green, very thick, somewhat fleshy, wrinkled when dry; standard > 6 mm wide (Tas. and southern Yorke Peninsula, SA) ..... 9. *D. sejugata*
- Calyx-lobes 0.5–1 mm long; phyllodes glaucescent, not very thick, nor fleshy nor wrinkled on drying; standard < 5 mm wide (central Australian parts of WA, NT, SA, Qld) ..... 4. *D. arthropoda*
- 144(133). Untidy plant with zigzag branchlets; phyllodes spreading widely or retrorse at base but curving round so that the apex points forward, narrowly elliptic or obovate, with margins longitudinally folded downwards to ± conceal the abaxial surface; midrib obscure or absent (WA) ..... 105. *D. tortuosa*
- Not as above ..... 145.
- 145(144). Phyllodes ± opposite, ovate to orbicular, cordate, with prominent reticulate venation; conspicuous involucre bracts present, ± orbicular, 4–5 mm diam. in flower, enlarging to ca. 2 cm when enclosing fruit (WA) ..... 24. *D. crenulata*
- Not as above ..... 146.
- 146(145). Phyllodes forming dense fascicles terminating each seasonal shoot, conspicuously pilose, linear, broadest at apex and tapering to base, 2–4 cm long (WA) ..... 26. *D. croniniana*
- Not as above ..... 147.
- 147(146). Phyllodes mostly < 2 cm long, variously shaped, spreading or erect; plants often hirsute, at least on branchlets ..... 149.
- Phyllodes 2–5 cm long, lanceolate, rigid and erect; plants glabrous ..... 148.
- 148(147). Inflorescence a short raceme of 2–4 flowers, with rachis clearly visible; pod turgid (WA) ..... 103. *D. daphnoides*
- Inflorescence 1-flowered (each axil may have up to 3 inflorescences, each with a cluster of bracts at the base of the pedicel), no rachis visible below pedicel; pod compressed (WA) ..... 30. *D. audax*
- 149(147). Flowers solitary or clustered in axils, rarely 2 on a common peduncle ..... 153.
- Inflorescence a manifestly pedunculate umbel ..... 150.
- 150(149). Phyllodes conspicuously and softly hirsute, green, broad-obovate to orbicular, 5–15 mm broad (WA) ..... 32. *D. mollis*
- Phyllodes glabrous or hirsute only on margins and midrib, often glaucous, variously shaped but not orbicular, 2–6 mm broad ..... 151.
- 151(150). Pedicels dilated upwards; phyllodes broadest around or above the middle; flowering October to January (WA) ..... 31. *D. lancifolia*
- Pedicels not or scarcely dilated upwards; phyllodes broadest around or below the middle; flowering July to October (an isolated population of *D. umbellulata* in New England flowers in summer) ..... 152.
- 152(151). Branchlets glaucous to pruinose; peduncles 10–30 mm long; pedicels viscid; calyx 4–5 mm long (WA) ..... 29. *D. pedunculata*
- Branchlets not glaucous; peduncles 3–18 mm long; pedicels not viscid; calyx 2.5–3.5 mm long (Qld, NSW) ..... 62. *D. umbellulata*
- 153(149). Phyllodes rhombic with conspicuously reticulate venation; flowers in axillary clusters (WA) ..... 28. *D. rhombifolia*
- Phyllodes not as above; flowers solitary (rarely 2) in each axil ..... 154.
- 154(153). Branchlets densely and obviously hirsute with white or cream hairs; flowers subsessile and almost hidden by the phyllodes; phyllodes lanceolate, folded upwards longitudinally, steeply ascending (though gently recurved) and overlapping along the branchlets, 10–20 mm long (WA) ..... 39. *D. abnormis*
- Branchlets often hirsute or hispid but inconspicuously so; flowers manifestly pedicellate and visible; phyllodes lanceolate to ovate-acuminate, convex, flat, concave or (in *D. euryloba*) somewhat folded upwards, spreading, often widely, usually < 15 mm long (to 20 mm in *D. cunderdin*) ..... 155.
- 155(154). Three node-like thickenings present on midrib and marginal nerves at junction of phyllode and branchlet (WA) (*D. cardiophylla* group) ..... 156.
- Articulation between phyllode and branchlet with 0 or 1 node-like thickening (eastern Australia) ..... 159.
- 156(155). Flowers large and red; keel 16–17 mm long; standard 12–15 mm long, with a pair of deltoid appendages (0.6–0.7 mm high) at base of lamina (WA) ..... 37. *D. cunderdin*
- Flowers smaller, predominantly yellow with red markings; keel 8–13 mm long; standard 6–10 mm long, with a pair of small calli or low ridges at base of lamina, these often indistinct ..... 157.
- 157(156). Phyllodes ± folded upwards longitudinally, or at least strongly concave above, mostly narrow-ovate or -elliptic; keel and style curving sharply upwards at an acute angle so that apex points in towards the standard; pod ± obtuse at apex (WA) ..... 38. *D. euryloba*
- Phyllodes flat to concave above but not folded upwards longitudinally, narrowly to very broadly ovate or elliptic; keel and style bent at an obtuse angle and pointing more outwards than upwards; pod acuminate at apex ..... 158.
- 158(157). Phyllodes narrow-ovate or -elliptic (length: breadth = 3:1–6:1), tapered, cuneate or rounded at base; calyx with a small callus below each sinus (WA) ..... 36. *D. umbonata*
- Phyllodes ovate to very broadly so (length: breadth ≤ 2:1), cordate at base; calli usually lacking on calyx (WA) ..... 35. *D. cardiophylla*
- 159(155). Lamina of phyllodes glabrous but margins, midrib and branchlets often hispid ..... 163.
- Lamina of phyllodes, as well as most parts of plant, hispid, sometimes sparsely ..... 160.
- 160(159). Phyllodes broad-ovate; apex long-acuminate, 3–7 mm long; margins undulate (Qld, NSW) ..... 57. *D. villifera*

- Phyllodes mostly narrow-oblong or -ovate; apex short-acuminate, 1–2 mm long; margins strongly recurved ..... 161.
- 161(160). Inflorescence rachis (portion at base bearing bracts) about equal to or longer than pedicel (portion above highest bract), hispid; calyx including stipe-like receptacle 2.8–3.3 mm long (NSW)..... 60. *D. pubigera*
- Inflorescence rachis much shorter than pedicel(s), sometimes absent, glabrous; calyx including receptacle 2.3–2.8 mm long (Qld) (59. *D. filipes*) ..... 162.
- 162(161). Inflorescences all simple, axillary; flowers solitary or an umbellate pair (Qld, White Mts to Darling Downs) ..... 59a. *D. filipes* subsp. *filipes*
- Terminal 1–5-flowered racemose or paniculate inflorescences present in addition to simple axillary inflorescences (Qld, Mareeba to Ravenshoe) ..... 59b. *D. filipes* subsp. *terminalis*
- 163(159). Phyllodes broadly to narrowly ovate or cordiform; venation reticulate or obscure; margins recurved (in *D. nova-anglica*) or undulate ..... 165.
- Phyllodes broadly to narrowly oblong or elliptic; adaxial surface of phyllode with 2 usually prominent longitudinal veins between midrib and margins; margins recurved (Qld) (59. *D. filipes*)..... 164.
- 164(163). Inflorescences all simple, axillary; flowers solitary or an umbellate pair (Qld, White Mts to Darling Downs) ..... 59a. *D. filipes* subsp. *filipes*
- Terminal 1–5-flowered racemose or paniculate inflorescences present in addition to simple axillary inflorescences (Qld, Mareeba to Ravenshoe) ..... 59b. *D. filipes* subsp. *terminalis*
- 165(163). Uppermost bracts in cluster at base of pedicel 1–1.5 mm long, 0.5–0.75 mm broad; phyllodes ovate or narrow-ovate, rounded or subcordate at base, acute or acuminate at apex; margins recurved (NSW)..... 61. *D. nova-anglica*
- Uppermost bracts in cluster at base of pedicel 0.3–0.8 mm long, 0.25–0.6 mm broad; phyllodes ovate, broad-ovate or cordiform, cordate to truncate at base, cuspidate at apex; margins undulate ..... 166.
- 166(165). Keel not falcate, 2.0–2.2 mm broad, scarcely acute; upper 2 calyx-lobes acuminate, scarcely broader or united higher than lower 3 (NSW)..... 56. *D. squarrosa*
- Keel falcate, 1.4–1.5 mm broad, conspicuously beaked; upper 2 calyx-lobes united in a truncate emarginate lip..... 167.
- 167(166). Hairs along branchlets twisted and bent in every direction (Qld)..... 58. *D. quoquoversus*
- Hairs standing straight out from branchlets (Qld) ..... 57. *D. villifera*

### I. *D. anceps-pachyloma* Clade

1. *Daviesia anceps* Turczaninow (1853: 266), Bentham (1864: 89), Crisp (1995: 1169). Type: ‘*Drum. V. n. 86.*’ Holotype: KW; isotypes: BM, K (3 sheets), G, MEL, P, W

Straggling, sometimes intricate *shrubs*, to 50 cm high, glabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* modified to cladodes, compressed but not winged ( $\pm$  biconvex), 1–2 mm broad, striate when dry with warty ridges that are transparent and appearing resinous. *Phyllodes* all reduced to small, exstipulate scales. *Inflorescence*: flowers solitary in axils of uppermost 1–3 scale-leaves (= bracts), thus comprising undifferentiated racemes terminating main or lateral shoots; *peduncle* nil; *subtending bracts* triangular, 1.5–2 mm long. *Pedicels* 2–3 mm long. *Calyx* 6–7 mm long including the 1–2 mm receptacle; lobes 2.5–4 mm long; upper 2 lobes united higher and closer than the lower 3, narrowly triangular; lower 3 lobes triangular. *Corolla*: *standard* very broadly elliptic, emarginate, 8–8.5  $\times$  7–7.5 mm including the ca. 0.75 mm claw, with 2 calli at the base of the lamina, yellow with a triangular red border, and fine red veins radiating outward, around the yellow centre; *wings* narrowly elliptic with a rounded, upswept apex, adaxially auriculate, also with a small lobe about 1/3-way along the abaxial margin, ca. 7.5  $\times$  2 mm including the 1–1.5 mm claw, with a channel from the auricle to part-way along the lamina, yellow; *keel* half transversely broadly elliptic (canoe-shaped), acute, auriculate, saccate, ca. 7.5  $\times$  3 mm including the ca. 2–2.5 mm claw, yellow. *Stamens* uniform; filaments free, terete, tapering towards the apex; anthers 2-celled, versatile. *Pod* obliquely shallowly obtriangular with an acute to rounded apex, turgid, 7–9  $\times$  4–5 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 2).

**Flowering period:**—November to January. *Fruiting period*: from January.

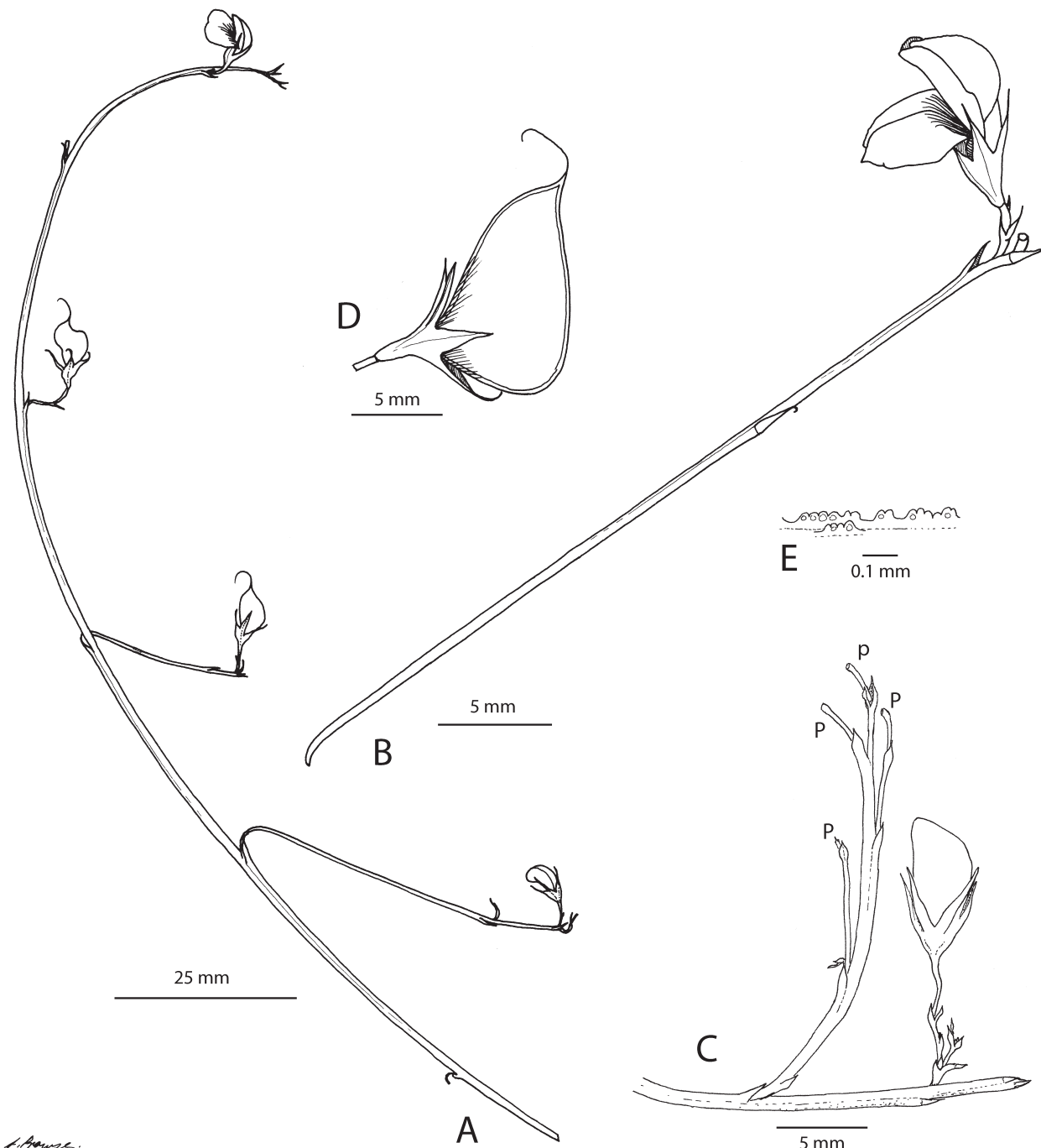
**Distribution:**—Western Australia, localised mainly around Ravensthorpe and along the adjacent south coast, especially in Fitzgerald River National Park and the Barrens.

**Habitat:**—Grows in sandy loam, clayey sand and gravelly or sandy laterite, in mallee or mallee-heath.

**Selected specimens (20 examined):**—WESTERN AUSTRALIA. **Eyre:** 3 km S of Ravensthorpe, 33°37’S, 120°03’E, *R.D. Royce 9439*, 31 January 1971 (PERTH); 106 km from Esperance along road to Ravensthorpe, Munglinup River crossing, 33°43’S, 120°52’E, *M.D. Crisp 4937*, 8 January 1979 (CBG, MEL, NSW, PERTH);

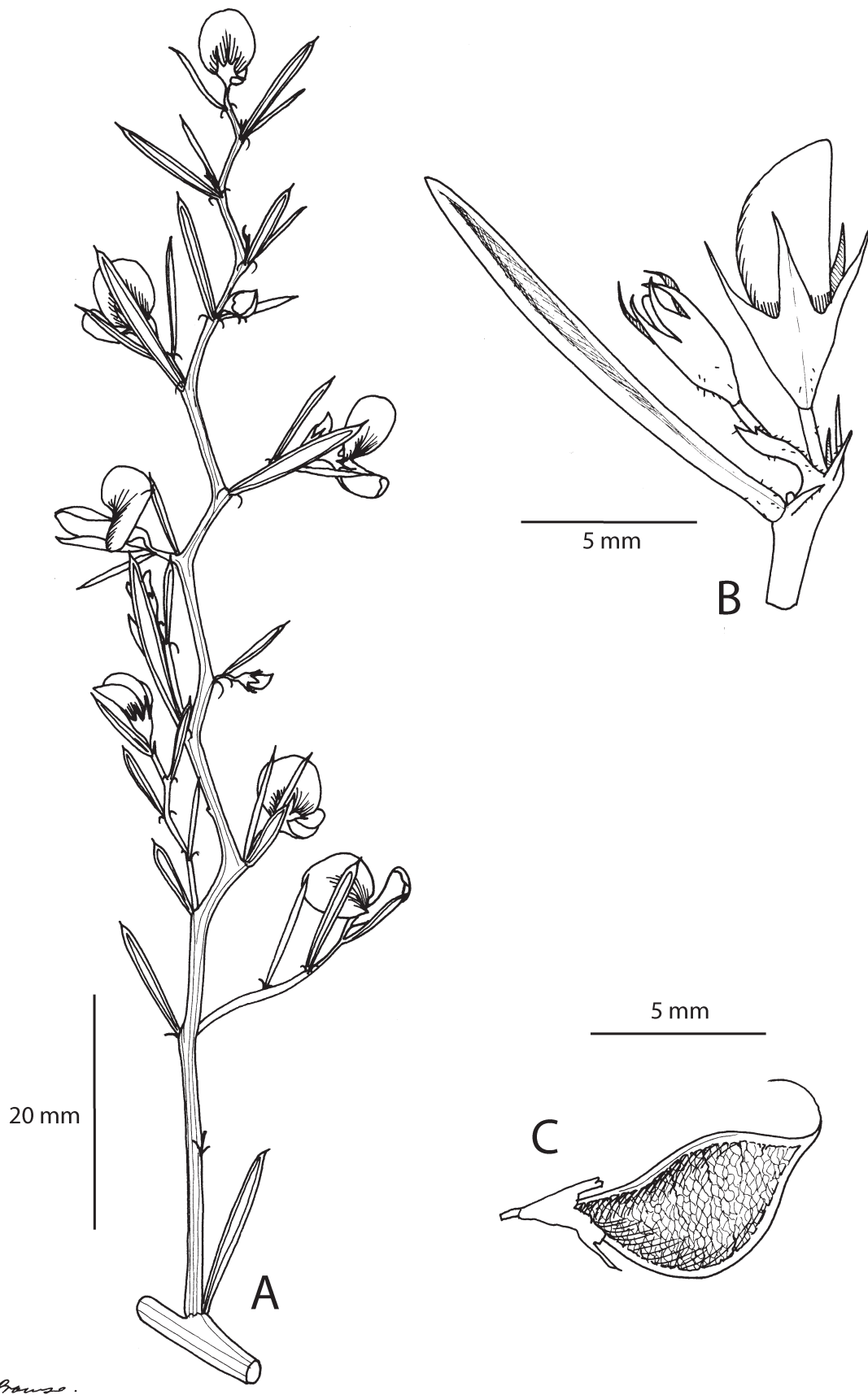
Fitzgerald River National Park, 3 km W of Annie Peak, 33°51'S, 119°57'E, *M.D. Crisp 5033*, 11 January 1979 (AD, BRI, CBG, MEL, NSW, PERTH); Fitzgerald River National Park, 7 km WNW of Annie Peak, 33°50'S, 119°55'E, *M.D. Crisp 5016*, 11 January 1979 (CBG); 12 km ESE of Ravensthorpe, 1.5 km E of Mt Desmond, 33°37'S, 120°10'E, *M.D. Crisp 4952*, 9 January 1979 (AD, CBG, PERTH).

**Affinity:**—See discussion under *D. pachyloma*.



**FIGURE 2.** *Daviesia anceps*. A. Flowering stem. B. Lateral branchlet with flower. C. Detail of inflorescences, with persistent pedicels of disarticulated flowers labelled 'p'. D. Pod. E. Detail of warty branchlet ridges. A from *Crisp 5033*; B from *Crisp 4937*; C, E from *Maxwell s.n.* (MEL 72504); D from *Crisp 4952*. Drawn by A.L. Prowse and M.D. Crisp.

**2. *Daviesia pachyloma*** Turczaninow (1853: 263, '*pachylima*'), Bentham (1864: 85, '*pachylina*'), Crisp (1995: 1220). Type: 'Drum. V. n. 43. Specimen imperfectum Gilbertianum, sub. n. 252, foliis angustioribus gaudens, verosimiliter huc etiam spectat.' Lectotype (Crisp 1995: 1220): *Drummond coll. V. no. 43* (KW); islectotype: BM (2 sheets), CGE, G, K (3 sheets), MEL, P, W. Syntype: Western Australia, *Gilbert 252*, 1842 (KW). Note: The published



**FIGURE 3.** *Daviesia pachyloma*. A. Flowering branchlet. B. Phyllode and terminal raceme. C. Pod. A, B from *George 6061*; C from *Smith s.n.* (CBG 8002069). Drawn by A.L. Prowse.

spelling of the epithet ('*pachylima*') was a transcription error from the original spelling '*pachyloma*' as seen in Turczaninov's handwriting on the lectotype. Whereas the spelling '*pachyloma*' (meaning thick-margined) was clearly intended to refer to the phyllodes, the published version '*pachylima*' is etymologically unintelligible. Perhaps this is why Bentham (1864: 85) altered the spelling to '*pachylina*' (meaning 'thick line', but with no apparent allusion to any part of the plant) Bushy, spreading *shrubs* with rigid, zigzagging branches to 0.5 m high, mostly glabrous but branchlets occasionally scabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* terete, ribbed, compressed to flattened vertically. *Phyllodes* scattered, ascending, very narrowly elliptic to linear, apically acuminate and pungent, basally articulate, with thickened margins, 8–65 × 1–2 mm, wrinkled when dry; *stipules* conspicuous, pungent. *Inflorescence*: flowers solitary in axils of uppermost 1–5 leaves or bracts, thus comprising undifferentiated racemes terminating main or lateral shoots; *peduncle* 0–2.5 mm long, glabrous to scabrous; *rachis* 0–1.5 mm long, glabrous to scabrous; *subtending bracts* oblong, keeled, 0.7–1.5 mm long, glabrous to scabrous. *Pedicel* 1–4 mm long. *Calyx* 5–6 mm long including the 1.5–2 mm receptacle; lobes triangular, 2–3 mm long; upper 2 lobes united higher and closer together than the lower 3. *Corolla*: *standard* ovate to very broadly ovate, emarginate, 6–10 × 6–7.5 mm including the 1–2 mm claw, with 2 very small calli at the base of the lamina, yellow with a triangular red border, and fine red veins radiating outward, around the yellow centre; *wings* oblong with a rounded to truncate apex, auriculate, 6–8 × 1.5–2.5 mm including the ca. 1.5 mm claw, yellow; *keel* half transversely elliptic (canoe-shaped), acute, auriculate, slightly saccate, 7–7.5 × 2–3.5 mm including the ca. 2 mm claw, pale creamy yellow. *Stamens* weakly dimorphic: inner whorl of 5 with slender, slightly shorter, versatile anthers; outer whorl of 5 with oblong, longer, basifixed anthers; filaments free, ca. uniform, broad and flattened, tapering towards the apex; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, acute, with a long, persistent style, compressed, ca. 8 × 3.5 mm; upper suture sigmoid; lower suture obtuse. *Seed* irregularly ellipsoid, 2.8–3.1 mm long, ca. 2 mm broad, 1.2–1.4 mm thick, lightly cream-coloured with some black mottling; *aril* ca. 1.7 mm long. (Fig. 3).

**Flowering period**:—March to January. *Fruiting period*: January to March.

**Distribution**:—Western Australia, scattered sparsely across the wheatbelt and semi-arid woodlands from Manmanning east to Zanthus and south to the latitude of Kulin and Holt Rock.

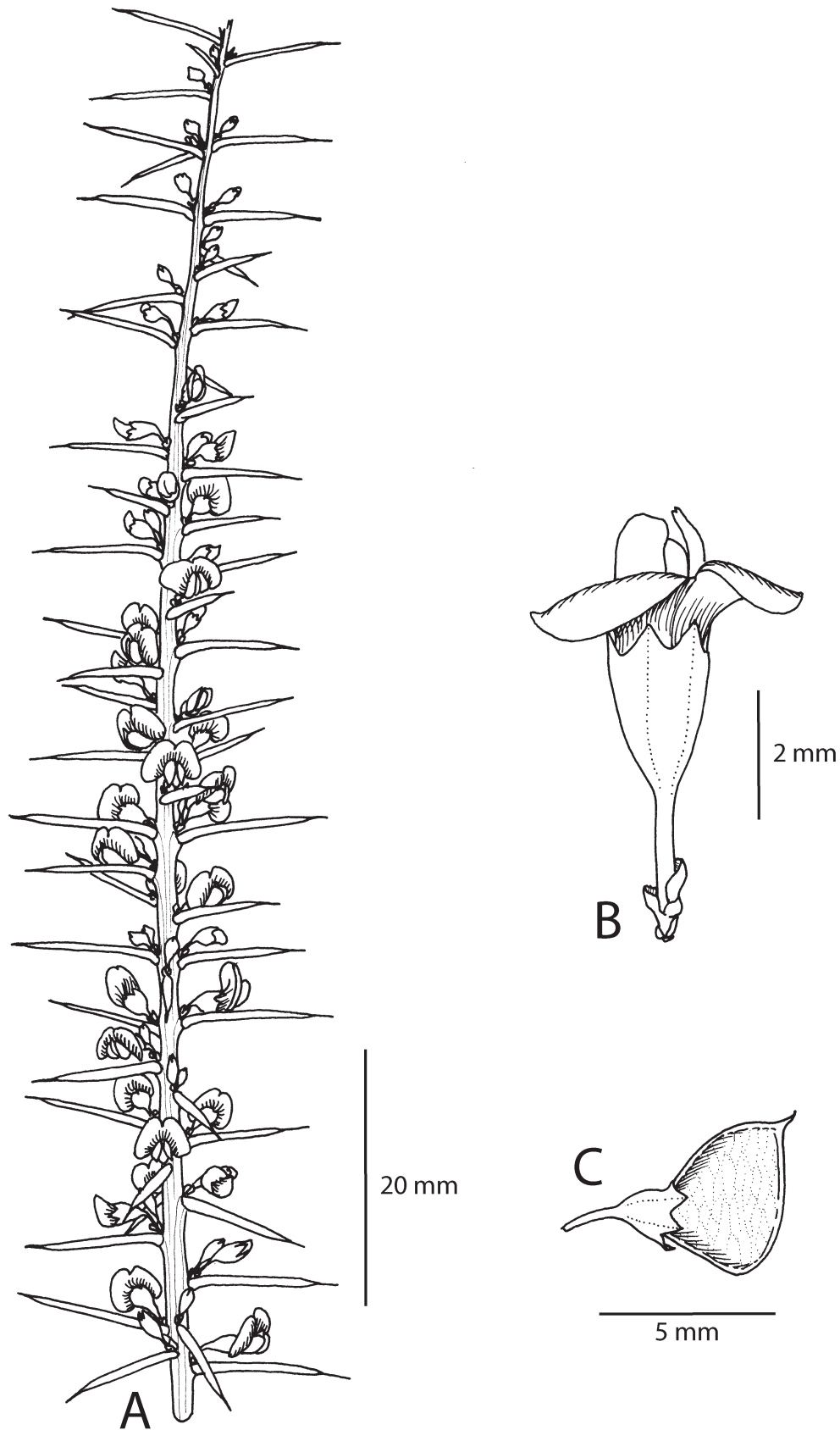
**Habitat**:—Grows in red or white, sometimes clayey, sand in mallee, often with *Triodia* Brown (1810a: 182).

**Selected specimens (30 examined)**:—**WESTERN AUSTRALIA**. **Avon**: 1 km SW of Manmanning, 30°52'S, 117°05'E, *B.H. Smith s.n.*, 17 March 1980 (CBG 8002069). **Coolgardie**: Warangering [Wargangering Rock], 31°11'S, 120°31'E, *R. Helms 1*, 14 November 1891 (AD, CANB, NSW). **Roe**: 43 km E of Hyden, on Norseman road, 32°25'S, 119°19'E, *A.S. George 6061*, 1 January 1964 (CANB, PERTH); 29 km E of Lake Grace towards Newdegate, 33°06'S, 118°48'E, *M.D. Tindale 203 & B.R. Maslin*, 20 March 1970 (CANB, NSW, PERTH).

**Affinity**:—Within the genus, only *D. anceps* shares with *D. pachyloma* an undifferentiated inflorescence, consisting of solitary flowers in the axils of the uppermost phyllodes or bracts at the tips of shoots. All other species have a differentiated unit inflorescence in the axil of a phyllode (or scale leaf), subtended by a cluster of involucre bracts at the base of a peduncle, with more barren bracts along the peduncle. Even in species with solitary flowers (e.g. *D. uniflora* and *D. ulicifolia*), the differentiated inflorescence structure is evident. *Daviesia anceps* differs from *D. pachyloma* in having scale leaves and flattened linear phylloclades. Other species of *Daviesia* lack the combination of linear-elliptic phyllodes with thickened margins and conspicuous, pungent stipules seen in *D. pachyloma*. *Daviesia reclinata* has a relatively undifferentiated inflorescence (long axillary racemes and terminal panicles), though there is a peduncle with barren bracts, as in most species of the genus. This species occurs in the monsoonal tropics (Arnhem Land and the Kimberley) and differs from *D. pachyloma* in having linear phyllodes 10–150 mm long and an accrescent calyx.

## II. *D. microcarpa* Clade

**3. *Daviesia microcarpa*** Crisp (1995: 1211). Type [approximate locality data given because the species is rare]: Western Australia, Coolgardie, near Norseman, 32°10'S, 121°50'E, *M.D. Crisp 5943, J. Taylor & R. Jackson*, 19 September 1979. Holotype: CBG; isotypes: CBG, K, NSW, PERTH



**FIGURE 4.** *Daviesia microcarpa*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A from *Brooker 6429*; B from *Crisp 5943* (type); C from *Whibley 4593*. Drawn by A.L. Prowse. Adapted from *Crisp (1995)* with permission from CSIRO Publishing.



Sprawling *shrubs* with many long, weak, tangled stems, to 0.4 m tall and 1 m broad, mostly glabrous but vegetative parts with scattered minute resinous warts, grey-green. *Root anatomy* normal (unistelar). *Branchlets* ascending, angular-terete with raised ribs. *Phyllodes* crowded (2.5–3.5 per cm), divaricate, needle-like, terete and smooth when fresh, angular with ribs when dry, apically pungent, basally articulate, 8–20 mm long, 0.5–0.75 mm diam., midrib more prominent on adaxial surface. *Unit inflorescences* 1 or 2 per axil, 1(2)-flowered; *peduncle* 0.5–1.5 mm long; *subtending bracts* oblong, clasping the pedicel, ca. 0.75–1 mm long. *Pedicels* ca. 1 mm long. *Calyx* ca. 3 mm long including the ca. 1 mm stipitate receptacle to which it is abruptly contracted; lobes  $\pm$  equal, triangular, straight, acute, apiculate, ca. 0.5 mm long. *Corolla: standard* ovate, emarginate, auriculate, ca. 4–5  $\times$  5 mm including the ca. 1 mm claw, centrally channelled, orange with pinkish red on veins and towards centre; *wings* obovate, rounded and incurved at apex, scarcely overlapping, auriculate, with a lobe opposite the auricles on the abaxial margin, ca. 4–4.5  $\times$  1.5 mm including the ca. 1.5 mm claw, pinkish red with orange tips; *keel* half transversely ovate with a scarcely acute apex, auriculate, saccate, ca. 3.5–4  $\times$  1.5 mm including the ca. 1.5 mm claw, pale orange-pink. *Stamens* strongly dimorphic: inner whorl of 5 with terete filaments and subversatile anthers with confluent thecae; outer whorl of 5 with broad compressed filaments and basifixed 2-celled anthers; filaments cohering. *Pod* obliquely very broadly to shallowly obtriangular,  $\pm$  obtuse, 4–4.5  $\times$  3–3.5 mm, with raised reticulate venation; upper suture sigmoid; lower suture acute. *Seed* broadly obovoid, very small, ca. 2 mm long, 1.5 mm broad, 0.8 mm thick, yellow-brown with black mottling; *aril* ca. 0.8 mm long. (Fig. 4).

**Flowering period:**—August and September. *Fruiting period:* October.

**Distribution:**—Western Australia, known only from two disjunct populations, near Norseman and Southern Cross.

**Habitat:**—Grows on sand under *Eucalyptus* L'Héritier de Brutelle (1789: 18) or *Allocasuarina* Johnson (1982: 73) in shrubland with *Triodia*.

**Conservation status:**—National: Endangered. WA: Critically Endangered, Declared Rare Flora.

**Selected specimens (6 examined):**—Approximate locality data are given because the species is rare.

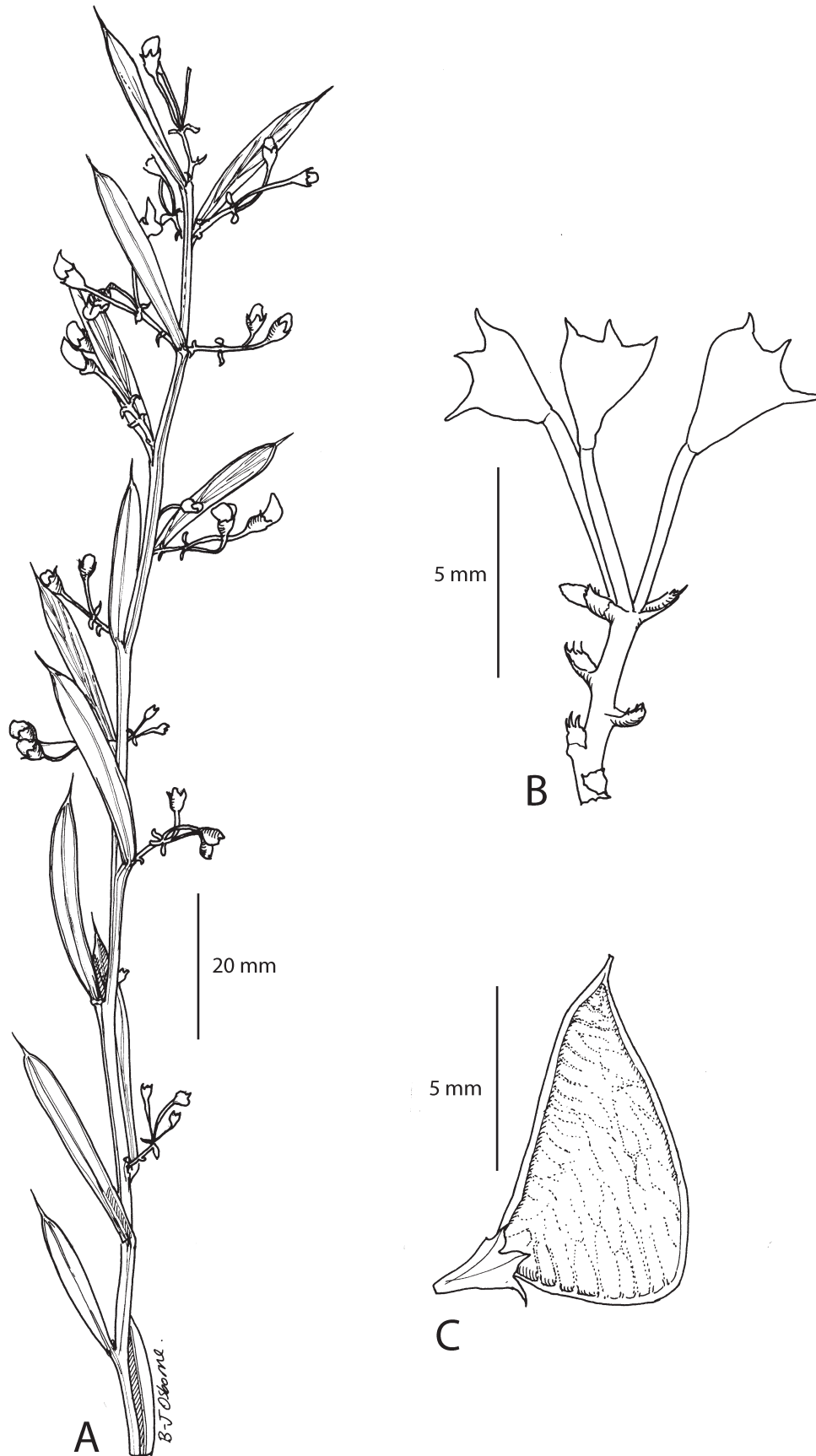
**WESTERN AUSTRALIA. Coolgardie:** Type population near Norseman, *M.I.H. Brooker* 6429, 21 August 1979 (CANB, PERTH); *ibid.*, *D.J.E. Whibley* 4593, 29 October 1974 (AD, PERTH); near Southern Cross, 31°10'S, 119°20'E, *M.D. Crisp* 9697 & *L.G. Cook*, 3 September 2004 (CANB, PERTH).

**Affinity:**—The molecular phylogeny (Fig. 1A) indicates that *D. microcarpa* has no close relative. The small sizes of the flowers and pods distinguish this species from nearly all its congeners: the pods are the smallest in the genus and only *D. ulicifolia* and *D. arthropoda* sometimes have similarly small flowers. *Daviesia arthropoda* and *D. ulicifolia* are easily distinguished by their horizontally flattened, well-spaced phyllodes, spinescent branchlet tips and larger pods (7.5–8 mm long). *Daviesia microcarpa* is most similar to *D. ulicifolia* subsp. *stenophylla* in coastal northern New South Wales and Queensland. As well as similar floral size and fruiting morphology, these taxa have 1-flowered inflorescences in common. However, the phyllodes of *D. ulicifolia* subsp. *stenophylla* are trigonous in cross-section, the habit is open and divaricate, the branchlets are spinescent, the standard lacks auricles and has a claw nearly as long as the lamina, and the pod is acute. *Daviesia genistifolia* is also very similar but can be distinguished by its well-spaced phyllodes, 2–6-flowered racemes and zygomorphic calyx with the upper two lobes united into a lip. It does not occur west of the Flinders Ranges in South Australia.

### III. Actinomorphic Calyx Clade

**4. *Daviesia arthropoda*** Mueller (1874: 225), Crisp (1981: 149), Crisp (1995: 1211), Craigie (2015: 27). Type: 'In monte Olga; E. Giles.' Holotype: MEL; isotype: PERTH

Divaricate, glabrous *shrubs*, 0.5–1 m high, glabrous, glaucescent. *Root anatomy* unknown. *Branchlets* divaricate, spinescent, terete, ribbed. *Phyllodes* scattered, divaricate or ascending, narrowly obovate with an acuminate pungent apex, basally cuneate, articulate at branchlet, (16–)20–40(–90)  $\times$  (2.5–)3–5(–7) mm; venation apparent and midrib more prominent on adaxial side. *Unit inflorescences* 1 or 2 per axil, umbellate, (1)2–4-flowered; *peduncle* (1–)4–8 mm long; *barren basal bracts* oblong, hooded, keeled, lacerated at the apex, ca. 0.5–1 mm long; *subtending bracts* oblong, lacerated at the apex, slightly keeled, ca. 1 mm long. *Pedicel* 3–8 mm long. *Calyx* 3–3.5 mm long including the 0.5–1.2 mm receptacle; lobes  $\pm$  equal, straight, triangular; upper 2 lobes ca. 1 mm long; lower 3 lobes ca. 0.75 mm long. *Corolla: standard* sessile, broadly elliptic, ca. 4  $\times$  3 mm, occasionally with small calli, yellow with red infusion towards the centre; *wings* elliptic, auriculate, ca. 4.5  $\times$  1.5 mm including the ca. 1 mm



**FIGURE 5.** *Daviesia arthropoda*. A. Flowering branchlet. B. Inflorescence with floral parts except calyx removed. C. Pod. A, B from George 12088, C from Latz 2656. Drawn by B-J. Osborne.

claw, yellow infused with red; *keel* half transversely broadly obovate, acute, auriculate, saccate, ca. 4 × 2.5 mm including the ca. 1.5 mm claw, yellow. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, slender, basifixed, 2-celled anthers; filaments free, overlapping. *Pod* obliquely shallowly obtriangular with an acuminate apex, compressed, 7.5–8 × 5–6 mm; upper suture almost straight to slightly sigmoid; lower suture acute but broadly rounded. *Seed* not seen. (Fig. 5).

**Flowering period:**—April to August. *Fruiting period:* April to August.

**Distribution:**—Widespread and scattered across the sandy deserts of central Australia, from the Little Sandy Desert (Western Australia), through south-western Northern Territory and north-western South Australia to east of Windorah, Queensland.

**Habitat:**—Grows on sand dunes with spinifex, e.g. *Triodia basedowii* E. Pritzel (1918: 356), and *Acacia* spp.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed. NT: Least concern. Qld: Not listed. This species is considered possibly threatened (WA) but occurs mostly in uninhabited sandy deserts and is not often collected for this reason alone. Most collections have come from the Alice Springs to Uluru region, which has exceptional road access compared with the rest of the range of *D. arthropoda*.

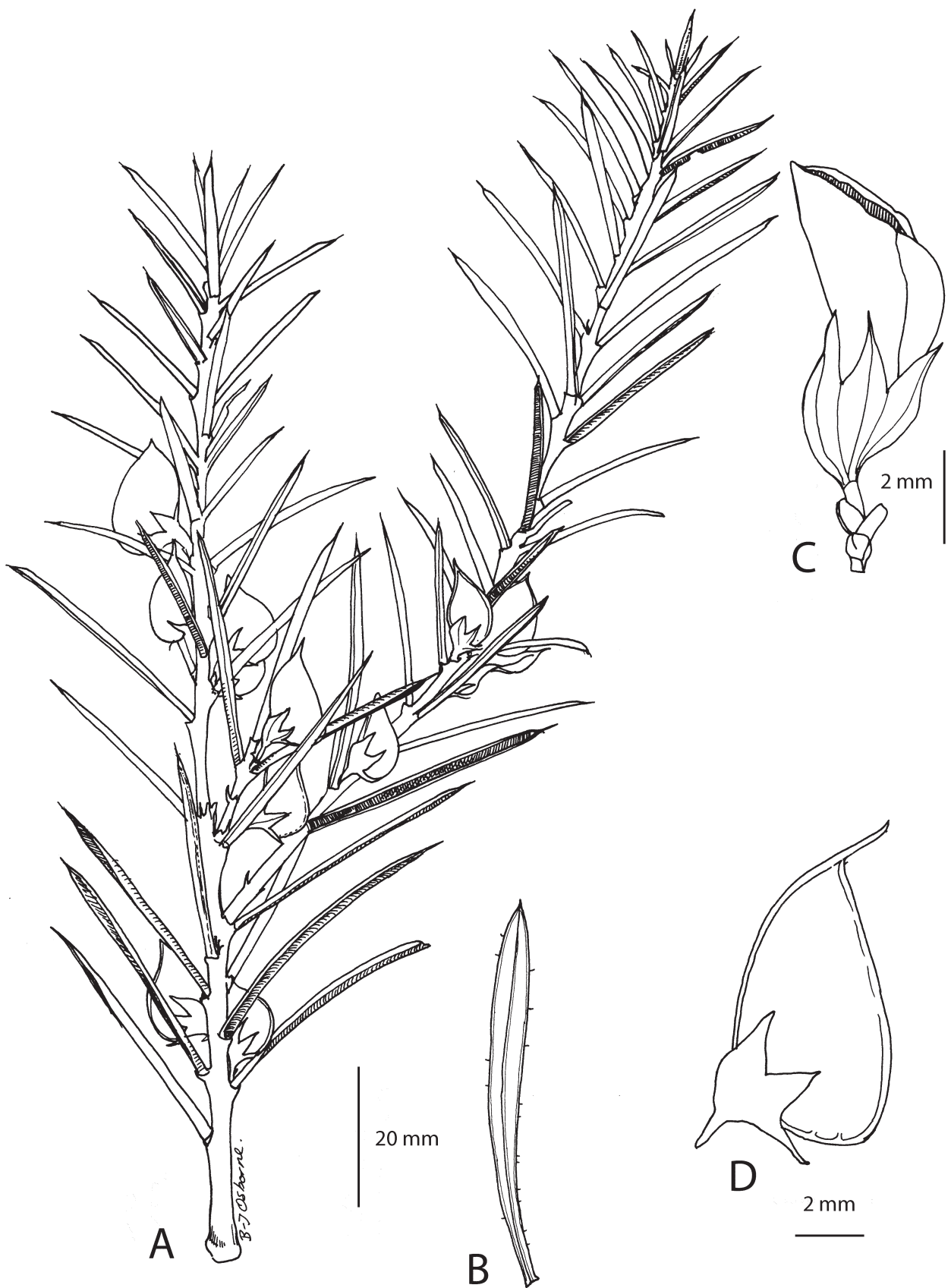
**Selected specimens (15 examined):**—**WESTERN AUSTRALIA. Giles:** Between Anne Range and Walter Jones Range, ca. 24°40'S, 128°50'E, *A.S. George 12088*, 22 July 1974 (AD, CANB, MEL, PERTH). **NORTHERN TERRITORY. Central Australia South:** Ca. 6.5 km N of Ayers Rock, 25°18'S, 131°03'E, *J.R. Maconochie 1821*, 24 August 1973 (AD, CANB, K, MO, NT, TEXAS); ca. 6.5 km NNW of Ayers Rock [Uluru], 25°18'S, 131°03'E, *P.K. Latz 2656*, 13 August 1972 (BRI, CANB, DNA, MEL, NSW, NT); Bloods Range, ca. 24°40'S, 129°35'E, *J.R. Maconochie 1401*, 10 April 1972 (AD, CANB, DNA, MEL, NSW, NT, PERTH). **SOUTH AUSTRALIA. Nullarbor:** Maralinga, 31°10'S, 131°35'E, *F. L. Hill 803*, 7 September 1956 (BM). **QUEENSLAND. Gregory North:** Retreat to Jundah, 25°00'S, 143°10'E, *S.T. Blake 12071*, 11 July 1936 (BRI).

**Affinity:**—*Daviesia arthropoda* closely resembles *D. sejugata* and *D. ulicifolia*. The phyllodes of *D. sejugata* resemble those of *D. arthropoda*, though *D. sejugata* has more elliptic phyllodes (except for specimens on the Yorke Peninsula, South Australia) that are markedly thicker, whereas those of *D. ulicifolia* are ovate to occasionally elliptic, but never obovate nor as long as *D. arthropoda* nor as thick as *D. sejugata*. The inflorescences of *D. sejugata* and some subspecies of *D. ulicifolia* (e.g. subsp. *aridicola*, though these are more racemose, subsp. *incarnata* and subsp. *ulicifolia*) are umbellate, though the peduncle and pedicel are much shorter than those of *D. arthropoda*. The standard of *D. sejugata* (except for specimens on the Yorke Peninsula, see discussion under this species) and *D. ulicifolia* has a claw, whereas *D. arthropoda* has a sessile standard. The standard in *D. arthropoda* is much less broad than that of *D. sejugata* (which is 6.5–7.5 mm).

**5. *Daviesia acicularis*** Smith (1805: 506), Bentham (1864: 81), Stanley & Ross (1983: 254), Crisp (1995: 1169), Crisp (2002: 527). Type: 'Port Jackson, N.S. Wales, *Mr. White*, 1793' Holotype: LINN; isotypes: BM, G (3 sheets), LIV

*D. pungens* A.Cunn. ex Bentham (1837b: 11), *nom. inval.*, given as a synonym of *D. acicularis* Sm. Type: Not designated.

Erect *shrubs*, 0.2–1 m high, glabrous to densely hispid on branchlets. *Root anatomy* normal (unistelar). *Branchlets* ascending, not spinescent, terete, ribbed. *Phyllodes* scattered, spreading and gently recurved, horizontally compressed or flattened but often appearing terete because of the revolute margins, linear, apex acuminate and pungent, margins with scattered teeth, base cuneate, articulate, 9–42 × 0.75–4 mm. *Juvenile phyllodes* obovate to elliptic, flat, hardly spinescent, (20–)25–65 × 3–10 mm for 3–4 nodes (though occasionally numerous) before grading into adult phyllodes. *Unit inflorescences* 1(2) per axil, 1-flowered; *peduncle* nil; *subtending bracts* ascending to appressed, oblong, ca. 1 mm long. *Pedicel* 1.5–2.5 mm long. *Calyx* 4–5 mm long including the 0.5–0.75 mm receptacle; lobes equal, triangular, 1.5–3 mm long. *Corolla: standard* broadly elliptic, emarginate, 6.5–7 × 5–6 mm including the ca. 1 mm claw, adaxially (yellow-) orange with with dark red veins radiating from a ring surrounding the pale yellow centre, abaxially mostly dark red especially the veins, with a central yellow stripe; *wings* obovate, apex rounded, deeply auriculate, 5.5–6.5 × 1.5–2 mm including the 1.5–2 mm claw, orange with a central maroon stripe tapering towards apex; *keel* half transversely ovate, acute, slightly auriculate, slightly saccate,



**FIGURE 6.** *Daviesia acicularis*. A. Fruiting branchlet. B. Developmentally intermediate phyllode. C. Flower. D. Pod. A from *Crisp* 6790; B from *Anon.* (NSW 35616); C from *Burgess s.n.* (CBG 7468); D from *Carolin* 3880 (SYD). Drawn by B-J. Osborne.

5.5–6 × 1.5–1.75 mm including the ca. 2.5 mm claw, apically dark red, becoming paler and pink towards base. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and longer, oblong, 2-celled, basifixed anthers; filaments free. *Pod* obliquely shallowly obtriangular with an acuminate apex and long, persistent style, 7–8 × 4.5–6 mm; upper suture sigmoid; lower suture acute. *Seed* globose, 3.5–4.3 mm long, 2.1–2.7 mm broad, 1.4–2 mm thick, light to dark brown with black mottling; *aril* 1.5–2 mm long. (Fig. 6).

**Flowering period:**—August to November. *Fruiting period:* October to December.

**Distribution:**—Widespread in eastern Australia, from Tambo, central Queensland, south-west to the Charleville and Gilruth Plains area, and also along the coast and Great Dividing Range from Fraser Island (Queensland) south through New South Wales to the Victorian border.

**Habitat:**—Grows on a variety of substrates, from sand to clayey sand or occasionally loam on plains, undulating terrain or mountain ridges, in open forest dominated by *Eucalyptus*, or mixed forest of *Eucalyptus* and *Callitris* Ventenat (1808: 10), or *Triodia* hummock grassland with *Eucalyptus* and *Acacia*.

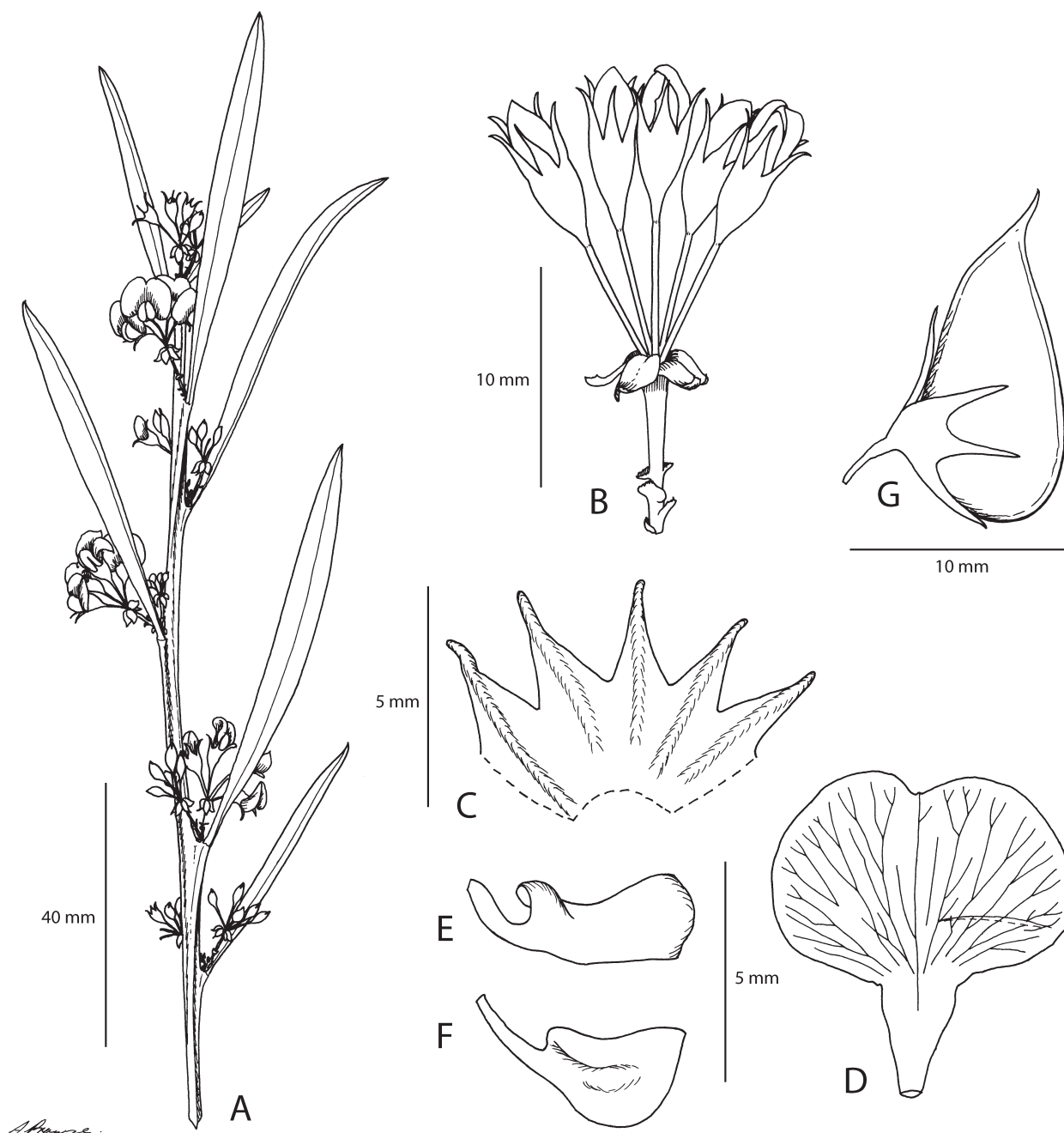
**Selected specimens (134 examined):**—**QUEENSLAND. Leichhardt:** Expedition National Park, near Robinson Gorge, 25°18'S, 149°11'E, *M.D. Crisp 11709*, 17 August 2016 (CANB, BRI). **Maranoa:** Moonee Highway, 29 km from Westmar, 27°59'S, 149°28'E, *D.W. Shoobridge s.n.*, 30 September 1964 (CBG 14288). **Moreton:** Redland Bay, 27°37'S, 153°18'E, *C.E. & D.T. Woolcock s.n.*, 16 August 1980 (CBG 8006125). **NEW SOUTH WALES. North Coast:** SW corner of Castlereagh State Forest, off The Northern Road, 33°41'S, 150°45'E, *R. Coveny 11885 & S. Goodwin*, 13 September 1984 (CANB, NSW). **North-west Slopes:** 24 km from Coonabarabran on the Narrabri road, 31°05'S, 149°22'E, *H. Streimann 635*, 7 December 1973 (A, CBG, K, L). **Central Coast:** Farm of Hawkesbury Agricultural College, Richmond, 33°36'S, 150°43'E, *Anon. s.n.*, 30 September 1906 (NSW 35616); Long Weeney Creek, 33°04'S, 150°38'E, *C. Burgess s.n.*, 9 September 1961 (CBG 7468). **Central Tablelands:** 6.5 km from Penrose along road to Bundanoon, 34°40'S, 150°16'E, *M.D. Crisp 6790*, 14 October 1980 (CBG). **Southern Tablelands:** Braidwood to Nerriga road, 21 km from Braidwood, 35°15'S, 150°00'E, *D.W. Shoobridge s.n.*, 28 October 1962 (CBG 13044). **AUSTRALIAN CAPITAL TERRITORY. Black Mountain, lower E slopes,** 35°16'S, 149°06'E, *R. Pullen 1975*, 13 November 1959 (CANB).

**Affinity:**—*Daviesia acicularis* is superficially similar to *D. ulicifolia*, though the toothed and usually recurved phyllode margins distinguish *D. acicularis* quite readily from *D. ulicifolia*. Occasionally, it has been confused with *D. genistifolia*, but the terete or vertically compressed phyllodes easily distinguish this species from *D. acicularis*.

**6. *Daviesia stricta*** Crisp (1982b: 63), Crisp (1995: 1239), Craigie (2015: 32). Type: South Australia, Flinders Ranges, Wilpena Pound, 31°30'S, 138°30'E, *M.D. Crisp 830*, 31 August 1974. Holotype: CBG; isotypes: AD, BISH, CANB, K, L, MEL, NSW, PERTH, US.

Open *shrubs* to 1.5 m high, glabrous. *Root anatomy* unknown. *Branchlets* unarmed, usually rigidly erect, compressed, triquetrous, narrowly winged, smooth. *Phyllodes* scattered, erect or ascending, compressed horizontally, narrowly to linearly elliptic, apically obtuse or acute, mucronate, tapered to articulate base, decurrent, 10–100 × 1.5–15 mm, with a prominent midrib and obscure venation, coriaceous, glaucescent. *Unit inflorescences* (1)2(–5) per axil, umbelliform, 3–5-flowered; peduncle 3–7 mm long; *barren basal bracts* ascending, smaller; *subtending bracts* reclinate, ovate, ca. 3 mm long. *Pedicels* slender, 2–5 mm long. *Calyx* 5–6.5 mm long including 1–1.5 mm receptacle, viscid, green on hypanthium and tube grading to maroon on lobes, accrescent in fruit; lobes uniform, ca. equal to tube, acuminate, recurved at tips, with raised midribs. *Corolla: standard* very broadly ovate, emarginate, ca. 7.5 × 6.5 mm including the 2.5 mm claw, orange with purplish markings; *wings* obovate with a rounded incurved apex, auriculate, 5–5.5 × 1.5–2 mm including the 1.5–2 mm claw, purplish; *keel* half very broadly elliptic, acute, slightly auriculate, saccate, ca. 4.5–5 × 2 mm including the 1.8–2 mm claw, purplish. *Stamens* strongly dimorphic: inner whorl of 5 with terete; filaments free and broadly ovoid, versatile anthers with confluent thecae; outer whorl of 5 with compressed filaments and ovoid, versatile, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, compressed, 9–13 × 5–7 mm, enclosed at base by enlarged calyx; upper suture slightly sigmoid; lower suture acute. *Seed* reniform in outline, compressed, ca. 4.5 mm long, ca. 2.5 mm broad, ca. 1.5 mm thick; *aril* not seen. (Fig. 7).

**Flowering period:**—August and September. *Fruiting period:* August to October.



**FIGURE 7.** *Daviesia stricta*. A. Flowering branchlet. B. Inflorescence in bud. C. Calyx. D. Standard. E. Wing. F. Keel. G. Pod with enlarged calyx. A from Crisp 829; B–G from Crisp 830 (type). Drawn by A.L. Prowse and M.D. Crisp. Adapted from Crisp (1980a) with permission from the Board of the Adelaide Botanic Gardens.

**Distribution:**—Known only from the Flinders Ranges, South Australia, where it extends from the Gammon Range south to Wilpena Pound and south-east to the vicinity of ‘Bibliando’ station.

**Habitat:**—Occurs on ridges and precipitous mountain slopes, on skeletal soils derived from quartzite. Associated vegetation is usually tall mallee-shrubland dominated by eucalypts such as *Eucalyptus flindersii* Boomsma (1980: 293) and *E. viridis* R.T.Baker (1900: 316), as well as sclerophyll shrubs such as *Melaleuca orophila* Craven (2006: 472) and *Triodia irritans* Brown (1810a: 182).

**Conservation status:**—National: Not listed. SA: Rare.

**Selected specimens (18 examined):**—Approximate locality data are given because the species is rare. **SOUTH AUSTRALIA. Flinders Ranges:** Gammon Plateau, 30°30’S, 139°00’E, *C.W. Bonython et al. s.n.*, 19 September 1956 (AD 95735023); Bibliando Station, 31°50’S, 139°00’E, *M.D. Crisp 759*, 14 April 1974 (CBG);

Wilpena Pound, 31°30'S, 138°30'E, *M.D. Crisp* 829, 31 August 1974 (CBG, K); *ibid.*, *M.D. Crisp* 834, 31 August 1974 (AD, AD, CBG); Bibliando Station, 31°50'S, 139°00'E, *M.D. Crisp* 898, 20 October 1974 (AD, BISH, BRI, CANB, K, MEL, MO, NSW); *ibid.*, *M.D. Crisp* 899, 20 October 1974 (AD, BM, CANB, K, L, NT, PERTH); Mt Hack, ca. 50 km SE of Leigh Creek, 30°50'S, 138°50'E, *T.R.N. Lothian* 5282 & 5283, 9 September 1973 (AD).

**Affinity:**—The only species likely to be confused with *D. stricta* is *D. wyattiana* which, despite obvious similarities in the inflorescence and the triquetrous, winged branchlets, may be readily distinguished by its calyx, which does not enlarge significantly in fruit, is not viscid, and has acute, green, scarcely recurved lobes. The peduncle (7–28 mm) and pedicels (7–15 mm) are longer in *D. wyattiana*, while the pod (7–10 mm) is shorter.

**7. *Daviesia wyattiana*** Bailey (1880: 102), Stanley & Ross (1983: 253), Crisp (1995: 1245), Crisp (2002: 527), Jeanes (1996: 756). Type: ‘... which I found about eighteen months ago growing among rocks at the Eight-mile Plain, a locality to the south of Brisbane.’ Lectotype (Crisp 1995: 1245): Eight-mile Plain amongst rocks, *F.M. Bailey s.n.*, October 1878 (MEL 72493); isolectotype: BM, BRI

Sparse *shrubs*, 1–2.5 m tall, glabrous. *Root anatomy* unknown. *Branchlets* triquetrous, angular, 1.5–3 mm broad. *Phyllodes* scattered, spreading to ascending, linear, apically acute or obtuse, tapered to articulate base, decurrent, 40–370 × 2–8(–10) mm, grey-green, glabrous; midrib prominent; venation pinnate, obscure. *Unit inflorescence* 1(–3) per axil, umbelliform, 4–7-flowered; *peduncle* 7–37 mm long; *barren basal bracts* triangular becoming oblong further up peduncle, keeled, to 1 mm long; *subtending bracts* oblong, keeled, spreading at tips, 1.5–2 mm long. *Pedicels* filiform, 6–17 mm long. *Calyx* 3.7–5 mm long including 0.75–1.5 mm receptacle, green except for dark red margins in the sinuses; lobes subequal, acute, ca. 1.5 mm long; upper 2 lobes united slightly higher than the lower 3, apices scarcely recurved. *Corolla: standard* depressed-ovate, emarginate, 6.5–8.5 × 6.5–9 mm including the 1–1.5 mm claw, with 2 small calli at the base of the lamina, yellow with red or purplish veins radiating from a ring surrounding the pale yellow centre; *wings* obovate with a rounded apex, strongly auriculate, 5–6.5 × 1.5–2.5 mm including the ca. 1.5 mm claw, basally red grading to orange or yellow at apex; *keel* half transversely elliptic, acute, auriculate, saccate, 4.5–5 × 1.5–2 mm including the 1–1.5 mm claw, light red. *Stamens* strongly dimorphic: inner whorl of 5 with slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate to acute, ± compressed, 7–11 × 4–6 mm; upper suture slightly sigmoid to slightly recurved; lower suture acute. *Seed* ellipsoid, 4.1–5.2 mm long, 2–2.5 mm broad, 1.4–1.7 mm thick, light brown with black mottling; *aril* 2.3–3 mm long. (Fig. 8).

**Common name:**—Long-leaf Bitter-pea.

**Flowering period:**—Rarely in April, mostly August to November. *Fruiting period:* Rarely in May, mostly September to December.

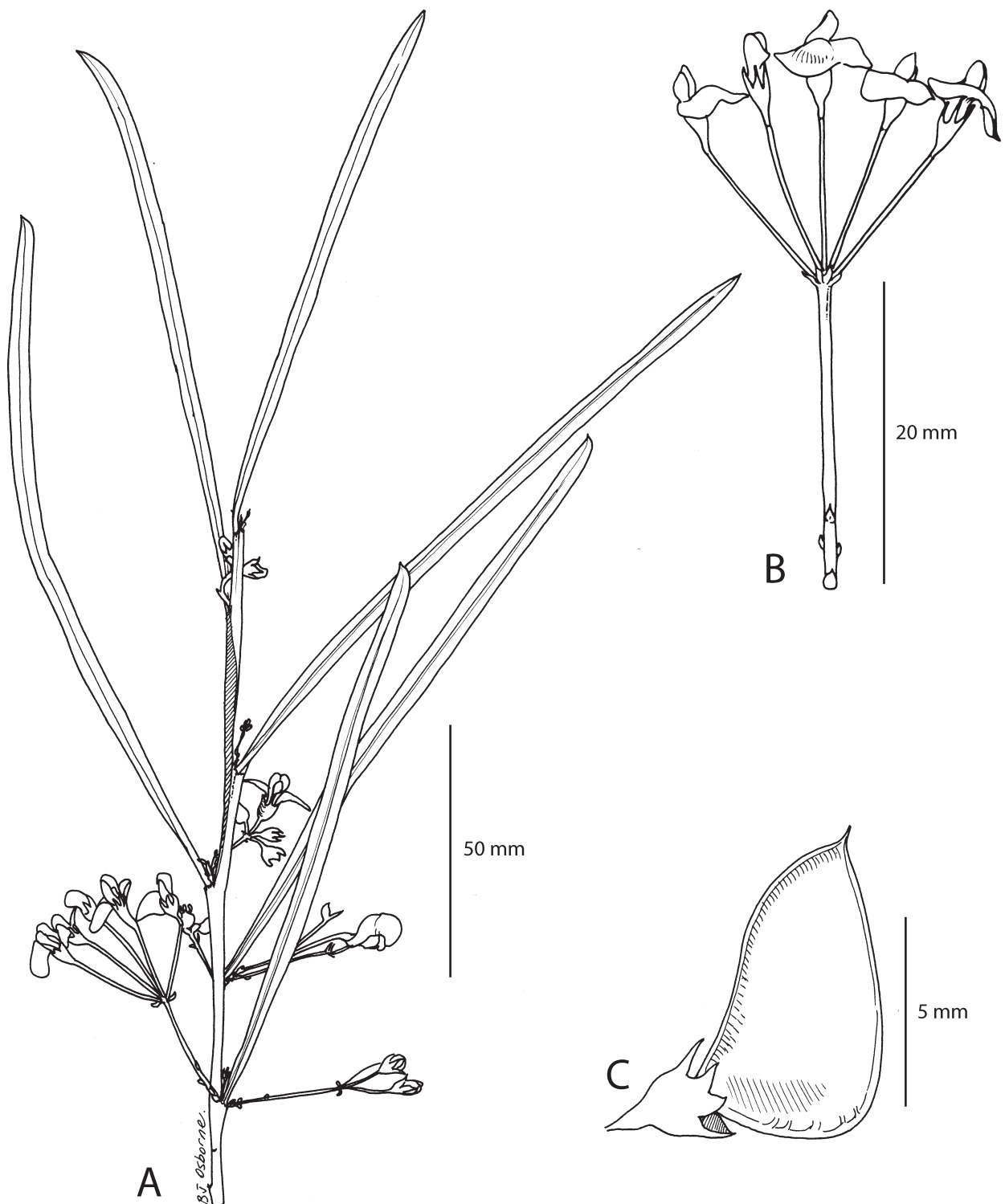
**Distribution:**—From the central sandstone ranges of Queensland, extending southward to the north coast of New South Wales almost as far as Coffs Harbour, then disjunct to the ranges of the NSW south coast and extending south to East Gippsland, Victoria.

**Habitat:**—Usually on ridges, on skeletal soils derived from sandstone, granite and acidic volcanic rocks, in the shrubby understorey of dry sclerophyll forest.

**Conservation status:**—Not threatened. The species is officially declared Vulnerable in Victoria because a small population occurs in the far east of the state; however, this is at the very southern end of its natural distribution and it occurs extensively in New South Wales and Queensland.

**Selected specimens (90 examined):**—[Approximate locality data given for Victoria because the species is rare there]. **QUEENSLAND. Burnett:** Beeron Holding, 5 km W of ‘Toondahra’ Homestead, 25°59'S, 151°21'E, *P.I. Forster* 5746 & *A.R. Bean*, 9 September 1989 (BRI, CANB, NSW). **Leichhardt:** Carnarvon National Park, 550 m N of Mt Playfair Road at 24.7 km W of turnoff from Salvator Rosa access road, 24°46'S, 146°56'E, *M.D. Crisp* 11733, 31 August 2016 (BRI, CANB); Expedition Range, Blackdown Tableland, South Mimosa Ck, 23°48'S, 149°04'E, *R.J. Henderson* 717, *S.B. Andrews* & *P. Sharpe*, 20 April 1971 (BRI, MEL); Isla Gorge, ca. 29 km SSW of Theodore, 25°09'S, 149°57'E, *S.L. Everist* 8016, 28 September 1968 (BRI). **Darling Downs:** Amiens, NW of Stanthorpe, 28°34'S, 151°48'E, *C.R. Frazier s.n.*, 6 October 1966 (NSW 96043). **Moreton:** 9.5 km ESE of Murphys Creek Rail Siding, 27°29'S, 152°09'E, *P.I. Forster* 7093 & *L.H. Bird*, 13 August 1990 (BRI, MEL, CANB); Mt Gravatt, 10 km S of Brisbane, 27°33'S, 153°04'E, *M.D. Crisp* 2554, 25 May 1977 (CBG). **NEW SOUTH WALES. North Coast:** Barcoongere State Forest, 40 km N of Coffs Harbour, 30°05'S, 153°05'E, *E.F.*

*Constable s.n.*, 18 October 1961 (NSW 70267, NT). **South Coast:** 22.5 km directly NNW of Nelligen, 2 km from Bimberamala Creek crossing toward Mares Hill on Western Distributor, 35°27'S, 150°05'E, *M.D. Crisp* 8361, 4 October 1990 (CBG, BRI, MEL, MO, NSW). **VICTORIA. Gippsland:** ca. 37°20'S, 149°20'E, *A.C. Beaglehole* 34082, 20 September 1970 (CANB, MEL).



**FIGURE 8.** *Daviesia wyattiana*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *Frazier s.n.* (NSW 96043); B from *Crisp* 2911; C from *Constable s.n.* (NSW 70267). Drawn by B.-J. Osborne.



**Affinity:**—*Daviesia wyattiana* most closely resembles *D. stricta*, which is endemic in the Flinders Ranges, South Australia. Though the umbellate inflorescences and triquetrous, winged branchlets are obvious similarities between these two species, *D. stricta* may be easily distinguished by the calyx, which enlarges significantly in fruit, is viscid, and has acuminate, maroon, strongly recurved calyx-lobes. Also, *D. stricta* has shorter peduncles (3–7 mm) and pedicels (2–5 mm), and longer pods (9–13 mm long).

**8. *Daviesia arenaria*** Crisp (1980b: 163), Crisp (1995: 1171), Jeanes (1996: 761), Crisp (2002: 527), Craigie (2015: 27). Type: New South Wales, South Far-western Plains, 31.5 km W of Euston along Sturt Highway towards Mildura (Victoria), 34°26'S, 142°28'E, *M.D. Crisp 5720*, 18 August 1979, fl., photos, spirit material. Holotype: CBG; isotypes: AD, K, L, MEL, NSW

[*Daviesia ulicina* var. *ruscifolia* auct. non (A.Cunn. ex Benth.) Black (1924: 296). Although J.M. Black made the combination, he misapplied it to material of *D. arenaria* (e.g. Black 1948: 435).]

*Shrubs*, generally low, spreading and hummocky, to 1.5 m tall and 2.5 m broad; vegetative parts rather stiffly pubescent or grey hispid, rarely glabrous. *Root anatomy* normal (unistelar). *Branchlets* divaricate, numerous, short, longitudinally ridged, rigid, spinescent. *Phyllodes* divaricate to ascending, horizontally compressed or flattened, mostly broadly ovate and cordate, occasionally narrowly to broadly elliptic and attenuate towards the articulated base, rarely obovate, apically cuspidate, pungent, rigid, 2.5–10 × 1.5–8 mm; upper surface grooved along the midrib and slightly folded upwards to give a V transection; lower surface thickened with raised marginal nerves and midrib; lateral venation finely reticulate, midrib more prominent on abaxial surface. *Seedling phyllodes* scattered, ovate, folded upwards along midrib or flat, apically acuminate, 7–11 × 5–9 mm. *Unit inflorescences* 1(2) per axil, 1-flowered; *peduncle* nil; *subtending bracts* clasping the pedicel, hooded, keeled, ca. 1 mm long. *Pedicel* 2–3 mm long, stiffly pubescent or glabrous. *Calyx* articulate at the pedicel, obliquely campanulate, 2.5–3.5 mm long, 10-ribbed, abruptly contracted at the base into the ca. 0.5 mm receptacle; lobes subequal, triangular, acute, minutely fimbriate at the margins, ca. 1 mm long, each with a raised midnerve extending upward from the hypanthium; upper 2 lobes slightly broader and lowermost one slightly longer than the others. *Corolla: standard* depressed-ovate, shortly decurrent with the claw, thickened and sigmoid along a line running up the claw to the base of the lamina, 6–7 × 5–6 mm including the 1–2 mm claw, orange-pink in front, intensely maroon on the back, with a greenish yellow central line on both sides; *wings* narrowly obovate, falcate, rounded at the apex, auriculate, with a small lobe opposite the auricles on the abaxial margin, saccate, ca. 6–7 × 2 mm including the 2 mm claw, maroon; *keel* connate along the lower margin except the claw, half broadly elliptic, incurved with an acicular beak, slightly auriculate, slightly saccate near the centre, ca. 6–7 × 1.5 mm including the 2 mm claw, maroon in the upper half. *Stamens* dimorphic: inner whorl of 5 with slightly longer, slender, scarcely compressed filaments and basifixed, cordate anthers with confluent thecae; outer whorl of 5 with slightly shorter, broader, compressed filaments and basifixed, 2-celled oblong anthers; filaments scarcely overlapping, free. *Pod* obliquely shallowly obtriangular, beaked with a persistent style, compressed, 6–7 × ca. 4 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, 2.7–3 mm long, 1.8–2 mm broad, 0.9–1.2 mm thick, brown with black mottling; *aril* 0.9–1.1 mm long. (Fig. 9).

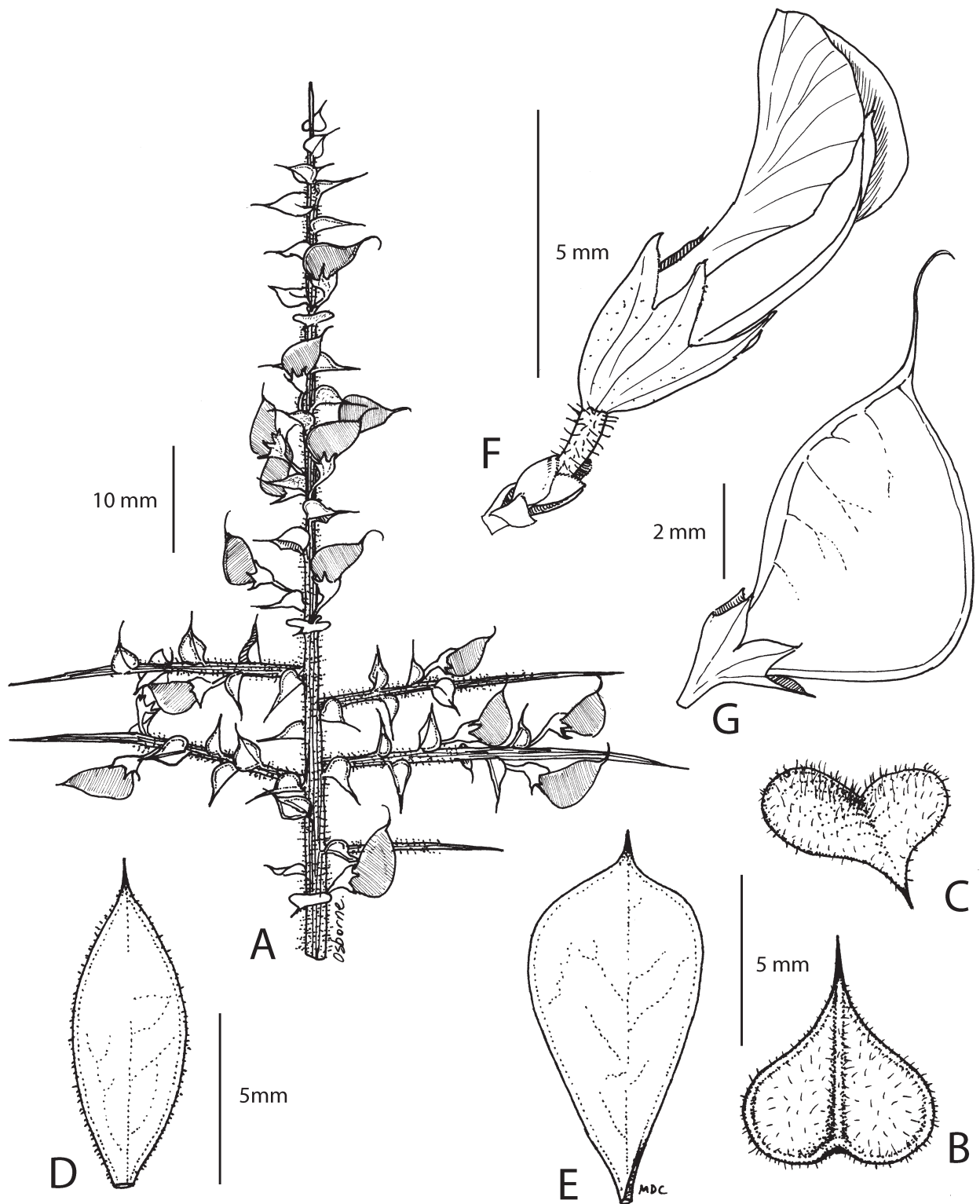
**Common name:**—Sandhill Bitter-pea.

**Flowering period:**—August to November. *Fruiting period:* October to January.

**Distribution:**—Widespread in the mallee districts of south-eastern Australia, from near Minnipa on the Eyre Peninsula, South Australia, south-east to the Grampians, Victoria, and north-east to Bogan Gate, New South Wales.

**Habitat:**—Typically on deep sand, often on the crests of dunes, in mallee, or open forest dominated by *Callitris* or *Eucalyptus* in wetter areas, where it can extend to skeletal soils on ridge tops. This species appears to favour openings in the tree canopy.

**Selected specimens (105 examined):**—**SOUTH AUSTRALIA. Eyre Peninsula:** Between Kimba and Minnipa, *K.B. Warnes 116*, 31 August 1969 (AD). **Lofty South:** Tanunda, ca. 65 km NE of Adelaide, 34°32'S, 138°58'E, *D.N. Kraehenbuehl s.n.*, 22 September 1962 (AD 96408105, MEL, NSW); Spring Gully Park, Clare, 33°50'S, 138°36'E, *R. Bates 349*, September 1978 (AD); pine forest between Gawler town and Light River, *H.H. Behr 190*, November 1918 (MEL); near Yatala Vale, 34°52'S, 138°38'E, *D.N. Kraehenbuehl 479*, 25 September 1961 (AD, NSW, W); Tanunda, 34°32'S, 138°58'E, *D.N. Kraehenbuehl 655*, 22 September 1962 (AD, MEL, NSW); Crystal Brook, *F.J.H. von Mueller s.n.*, November 1851 (MEL 0080786A). **Murray Basin:** Naracoorte–Bordertown



**FIGURE 9.** *Daviesia arenaria*. A. Branchlet with immature pods. B. Phyllode in abaxial view showing prominent midrib. C. Same phyllode in adaxial view showing central groove with inconspicuous midrib. D, E. More phyllodes showing shape variation, in adaxial view. F. Flower. G. Pod. A from *Haegi 687*; B, C & F from *Crisp 5720*; D from *Kraehenbuehl 479*; E from *Harris s.n.* (AD 21554); G from *Gaubas s.n.* (CBG 2711) A, F & G drawn by B-J. Osborne; B-E by M.D. Crisp.

road, near The Gap, 36°41'S, 140°40'E, *D. Hunt 5*, 31 August 1961 (AD); 20 km NE of Blanchetown on Waikerie road, 34°16'S, 139°48'E, *L. Haegi 687*, 5 October 1975 (AD, P, PR, RSA). **NEW SOUTH WALES. South Western Plains:** Shepherds Hill, Euabalong West, 33°03'S, 146°54'E, *G.M. Cunningham s.n.* & *P.L. Milthorpe*, 2

September 1974 (CANB 827690, NSW); near Condoblin, 33°05'S, 147°09'E, *E. Gauba s.n.*, 24 October 1956 (CBG 2711); 1.5 km E of Bogan Gate on Forbes to Condoblin road, 33°07'S, 147°50'E, *M.D. Tindale s.n.* & *C.K. Ingram*, 3 October 1956 (NSW 39157). **VICTORIA. Mallee:** 10 km S of Murrayville, Big Desert, 35°22'S, 141°12'E, *A.C. Beauglehole 57061*, 19 November 1977 (CANB, MEL); 90 km SSW of Mildura, 2.7 km WSW of Mt Crozier, 35°54'S, 141°40'E, *M.D. Crisp 3387*, 11 October 1977 (CBG). **Western Highlands:** Near Moora-Moora Reservoir, Grampians, 37°14'S, 142°26'E, *P. Mathews s.n.*, 3 January 1977 (MEL 0523836A). **CULTIVATED.** Australian National Botanic Gardens, Canberra (ex. *M.D. Crisp 3281*), *M.D. Crisp 5667*, 19 February 1979, seedling (CBG).

**Affinity:**—*Daviesia arenaria* is most closely related to *D. ulicifolia*, the most widespread and diverse species in the genus. *Daviesia ulicifolia* has a very variable phyllode shape and size but always has a convex upper surface with a prominent raised midrib, in contrast to the concave adaxial surface with a sunken midrib in *D. arenaria*. Compared with *D. arenaria*, the standard of *D. ulicifolia* is always paler (yellow to orange) towards the abaxial margin. Above all, the keel is broader, ± obtuse and neither incurved nor apiculate at the apex. Also, *D. ulicifolia* never has cordate phyllodes.

**9. *Daviesia sejugata*** Chandler & Crisp (1997: 33), Craigie (2015: 32). Type: Tasmania, Milford Estate, 7-mile Beach Road, Cambridge, 42°48'30"S, 147°30'30"E, *D.L. Jones 13473*, 8 October 1994. Holotype: CANB; isotypes: AD, HO, K

Divaricate *shrubs* to 2 m high, sometimes wider than high, usually glabrous, rarely hispid on inflorescence axes. *Root anatomy* unknown. *Branchlets* spinescent, prominently longitudinally ridged, angular. *Phyllodes* scattered, spreading to ascending, narrowly elliptic to obovate, pungent, articulated at base, (8–)15–33 × (1.5–)2.5–5.5 mm, thick and wrinkled in appearance when dry; upper (adaxial) face ± flat or convex with midrib more prominent than on abaxial face. *Unit inflorescences* 1 or 2 per axil, umbellate, 2–5-flowered; *peduncle* 1–1.5 mm long; *subtending bracts* ca. 1–1.5 mm long. *Pedicels* 2–4.5 mm long. *Calyx* campanulate, 3–4.5 mm long including ca. 1 mm receptacle; lobes equal, broadly triangular, slightly but clearly recurved, ca. 0.7–1.5 mm long, faintly ribbed. *Corolla: standard* very broadly obovate, emarginate, ca. 6–7 × 6.5–7.5 mm including ca. 2–2.5 mm claw (claw absent in Yorke Peninsula specimens), rich yellow with maroon infusion surrounding the intensely yellow centre; *wings* obovate, apically rounded, auriculate, ca. 6.3 × 2–2.5 mm including ca. 2–2.5 mm claw, red with orange infusion at tips; *keel* half transversely broadly obovate, acute, auriculate, ca. 5 × 2 mm including ca. 2 mm claw, dark purple. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and shorter, rounder, basifixed anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, versatile, 2-celled anthers; filaments free. *Style* curving gently upwards through 90°, not hooked. *Pod* obliquely shallowly obtriangular, acuminate, 8–11 × 4–6 mm; upper suture sigmoid; lower suture ca. 90°. *Seed* ellipsoid, 2.5–3 mm long, 1.2–1.5 mm wide, ca. 1.3 mm thick, orange-brown to tan with black mottling (rarely not); *aril* ca. 1.5 mm long. (Fig. 10).

**Flowering period:**—September and October. *Fruiting period:* unknown.

**Distribution:**—Disjunct on southern Yorke Peninsula and Kangaroo Island, South Australia, and in northern and eastern Tasmania.

**Habitat:**—On southern Yorke Peninsula, this species grows in mallee-heath dominated by *Eucalyptus diversifolia* Bonpland (1814: 35) and *Melaleuca lanceolata* Otto (1820: 36) on grey, stony calcareous soil. In Tasmania, it grows on sand in the heathy understorey of open forest dominated by eucalypts such as *E. obliqua* L'Héritier de Brutelle (1789: 18), *E. viminalis* Labillardière (1806: t. 151) and *E. amygdalina* Labillardière (1806: t. 154).

**Conservation status:**—National: Not listed. SA: Endangered but the species occurs commonly in Tasmania.

**Selected specimens (31 examined):**—Approximate locality data are given for SA because the species is rare there. **SOUTH AUSTRALIA. Yorke Peninsula:** vicinity of Marion Bay, 35°10'S, 137°00'E, *B. Copley 4751*, 9 September 1975 (AD); *ibid.*, *R. Bates 842*, 21 September 1980 (AD, OSA). **Kangaroo Island:** near Cape du Couedic, *P.G. Wilson 718*, 4 November 1958 (AD, B, K, SI). **TASMANIA.** King Island, near southern portion, *P. Barnett s.n.*, 28 October 1968 (MEL 0080557A); Epping Forest, 41°46'S, 147°21'E, *R. Gunn s.n.*, 17 October 1842 (CBG 7801704); near Port Arthur, ca. 43°09'S, 147°51'E, *A.V. Giblin s.n.*, 23 October 1929 (HO 10191); 1.5 km N of Cape Queen Elizabeth, Bruny Island, *J.H. Hemsley 6243*, 6 October 1967 (HO 10197, MEL 0080558A).

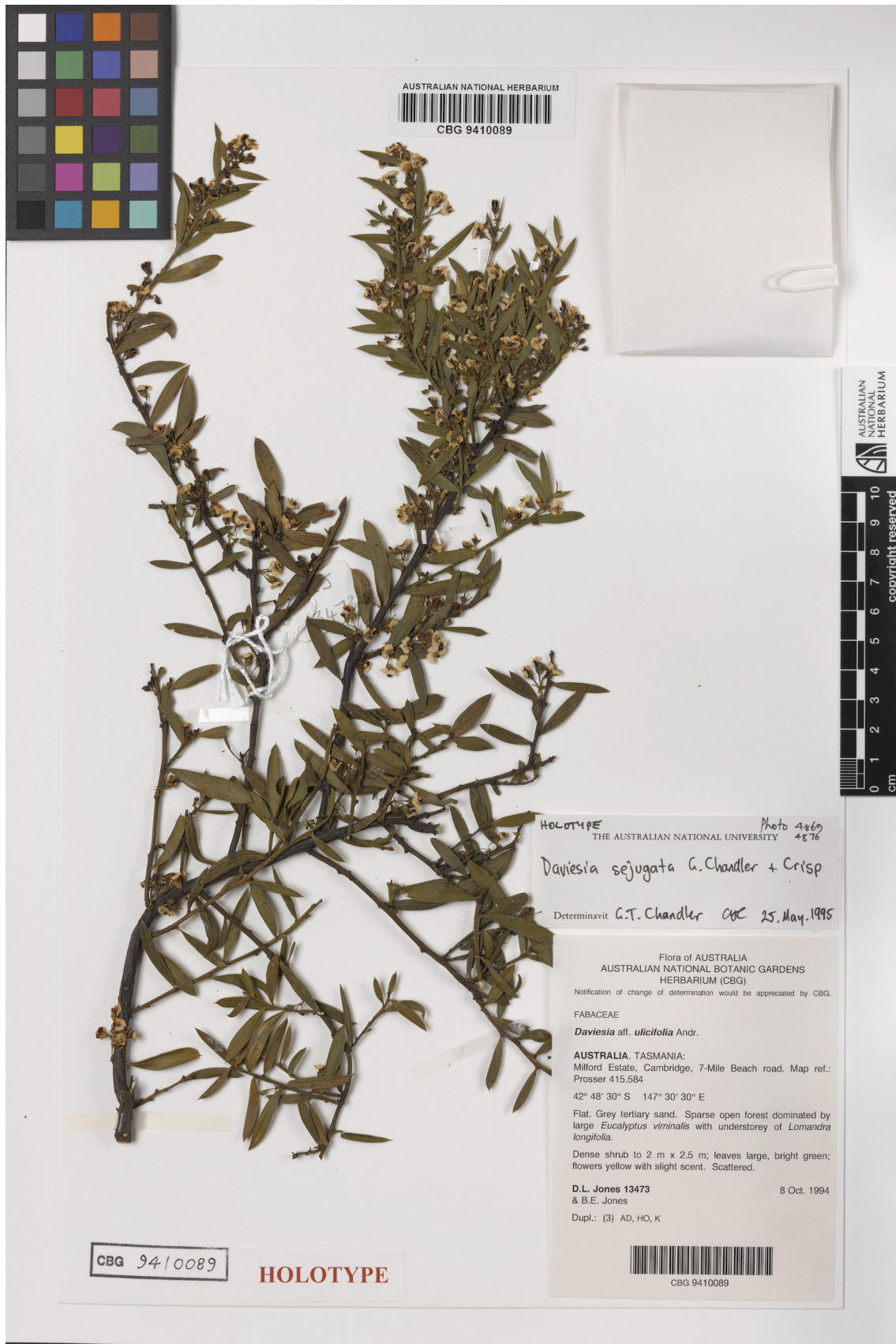


FIGURE 10. *Daviesia sejugata*. Holotype. Photograph provided by the Curator of CANB.

**Affinity:**—*Daviesia sejugata* shows a close resemblance to *D. arthropoda*, though it is closer to *D. ulicifolia* (Fig. 1A). The phyllodes of *D. sejugata* resemble those of *D. arthropoda*, though they vary from elliptic (or narrowly so) to obovate. *Daviesia arthropoda* and *D. sejugata* differ in the surface of the phyllode—that of *D. sejugata* appears wrinkled when dry because of its thickness, whereas that of *D. arthropoda* is thinner and not so wrinkled. The unit inflorescence of *D. arthropoda* is umbellate like that of *D. sejugata* but distinctly longer (peduncle 4–8 mm and pedicel 3–8 mm). The standard of *D. sejugata* is wider than that of *D. arthropoda*, in which the flowers tend to be quite small by comparison (e.g. calyx 3–3.5 mm long, standard ca. 4 × 3 mm). Finally, *D. arthropoda* has differently coloured flowers from *D. sejugata*, being predominantly yellow to somewhat orange, with diffuse red, generally paler, markings. Specimens of *D. sejugata* from Yorke Peninsula, South Australia, have consistently obovate phyllodes and a sessile standard as in *D. arthropoda*, but clearly fit *D. sejugata* in flower colour, robustness of the phyllodes, and in the shorter peduncles and pedicels.

The most reliable feature to diagnose *D. sejugata* from *D. ulicifolia* is the calyx, which is campanulate with broadly triangular, scarcely keeled lobes that are erect or slightly recurved from the base. By contrast, the calyx of *D. ulicifolia* is elliptic or obovate in outline, evenly curved from the tube to the lobes (which may be slightly recurved at the tips), and the lobes are narrow and strongly keeled. The phyllodes of *D. ulicifolia* are usually smaller than those of *D. sejugata* (with those of *D. ulicifolia* being ca. 5–17 mm long, occasionally up to 22 mm), and tend towards ovate rather than elliptic or obovate shapes, although elliptic phyllodes are not uncommon in some subspecies, such as subsp. *pilligensis*. The inflorescence varies in *D. ulicifolia*, and is often 1-flowered, but when umbellate tends to have shorter peduncles (up to 3 mm, though normally shorter) than in *D. sejugata*. Some of the subspecies of *D. ulicifolia* have large flowers as in *D. sejugata*, but then they are often predominantly red or orange (e.g. *D. ulicifolia* subsp. *incarnata*, subsp. *aridicola* and subsp. *ruscifolia*), whereas those of *D. sejugata* are predominantly yellow (as in *D. ulicifolia* subsp. *ulicifolia*, subsp. *stenophylla* and subsp. *pilligensis*).

In Tasmania, small-leaved plants of *D. sejugata* can be difficult to distinguish from the local form of *D. ulicifolia* subsp. *ulicifolia*. Nevertheless, the calyx characters described above distinguish the species in Tasmania too. The Tasmanian form of *D. ulicifolia* s.s. is usually hispid on the branchlets, whereas *D. sejugata* is always glabrous. The unit inflorescences of *D. sejugata* are distinctly pedunculate and 3- or more-flowered whereas those of *D. ulicifolia* s.s. are more or less sessile and usually 1- or 2-flowered. *Daviesia sejugata* is an altogether more rigid, robust, divaricate and diabolically prickly plant than *D. ulicifolia*. *Daviesia ulicifolia* subsp. *ruscifolia* also occurs in Tasmania but is easily distinguished from *D. sejugata* by its 1-flowered inflorescence, calyx (as in subsp. *ulicifolia*) and ovate to broadly ovate phyllodes.

**10. *Daviesia ulicifolia*** Andrews (1803: t. 304), Stanley & Ross (1983: 254), Jeanes (1996: 762), Crisp (1995: 1241), Chandler & Crisp (1997: 35), Crisp (2002: 527), Craigie (2015: 33). Type: ‘...from New Holland...Our drawing was made from the Hibbertian collection, in the month of May 1802.’ Type specimen unknown. Holotype: the plate

*Daviesia ulicina* Sm. ex Donn (1804: 76), *nom. nud. & inval.*

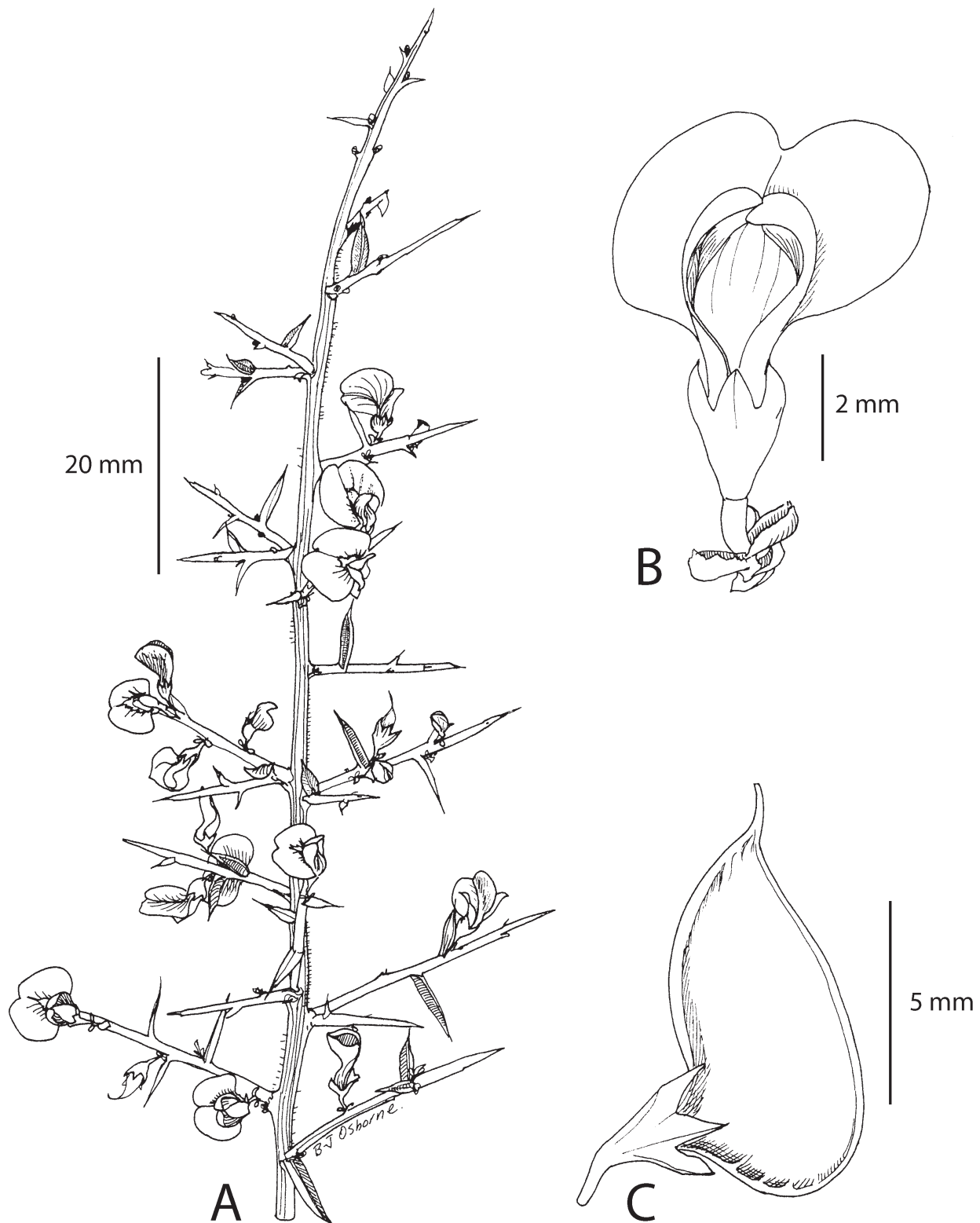
*Daviesia ulicina* Smith (1805: 506), Bentham (1864: 81). Type: [Port Jackson]. Holotype: LINN; isotype: LIV. *Nom. superfl. & inval.*—*D. ulicifolia* Andrews (1803) is given as a synonym.

*Daviesia genistoides* Loddiges (1830a: t. 1552). Type: ‘lately introduced from New Holland’. Type specimen unknown. Holotype: the plate.

*Daviesia ruscifolia* A.Cunn. ex Bentham (1837a: 11), Bentham (1839: 75). Type: ‘Nova Cambria australis, A. Cunningham...(v.s.)’. Holotype: Bushy sandstone ridge SW from Lake George, SW interior of N.S. Wales, *A. Cunningham* 64, April 1824 (W); isotypes: BM, CANB, CGE, K (2 sheets), NY).

[*Daviesia umbellata* Labillardière (1805: t. 137), *sphalm.* Specimens cited: ‘Habitat in capite Van-Diemen.’ Specimens seen: B, BM, FI-W, G, G-DC, P, S. *Daviesia umbellulata* auct. non Sm. var. *angustifolia* Candolle (1825: 114), Don (1832: 125). Notes: *Daviesia umbellata* Labill. is an erroneous spelling of *D. umbellulata* Sm. because Labillardière cited a full reference to Smith (1805: 506) and quoted the original diagnosis of *D. umbellulata* Sm. verbatim. Labillardière misapplied this name to material of *D. ulicifolia* Andrews, as well as misspelling it. Subsequently, Candolle (1825: 114) made the new name *D. umbellulata* var. *angustifolia* based on *D. umbellata* Labill. Similarly, Bentham (1864: 81) named *D. ulicina* f. *subumbellata* (see in synonymy of *D. ulicifolia* subsp. *ulicifolia*) based on *D. umbellata* Labill.]

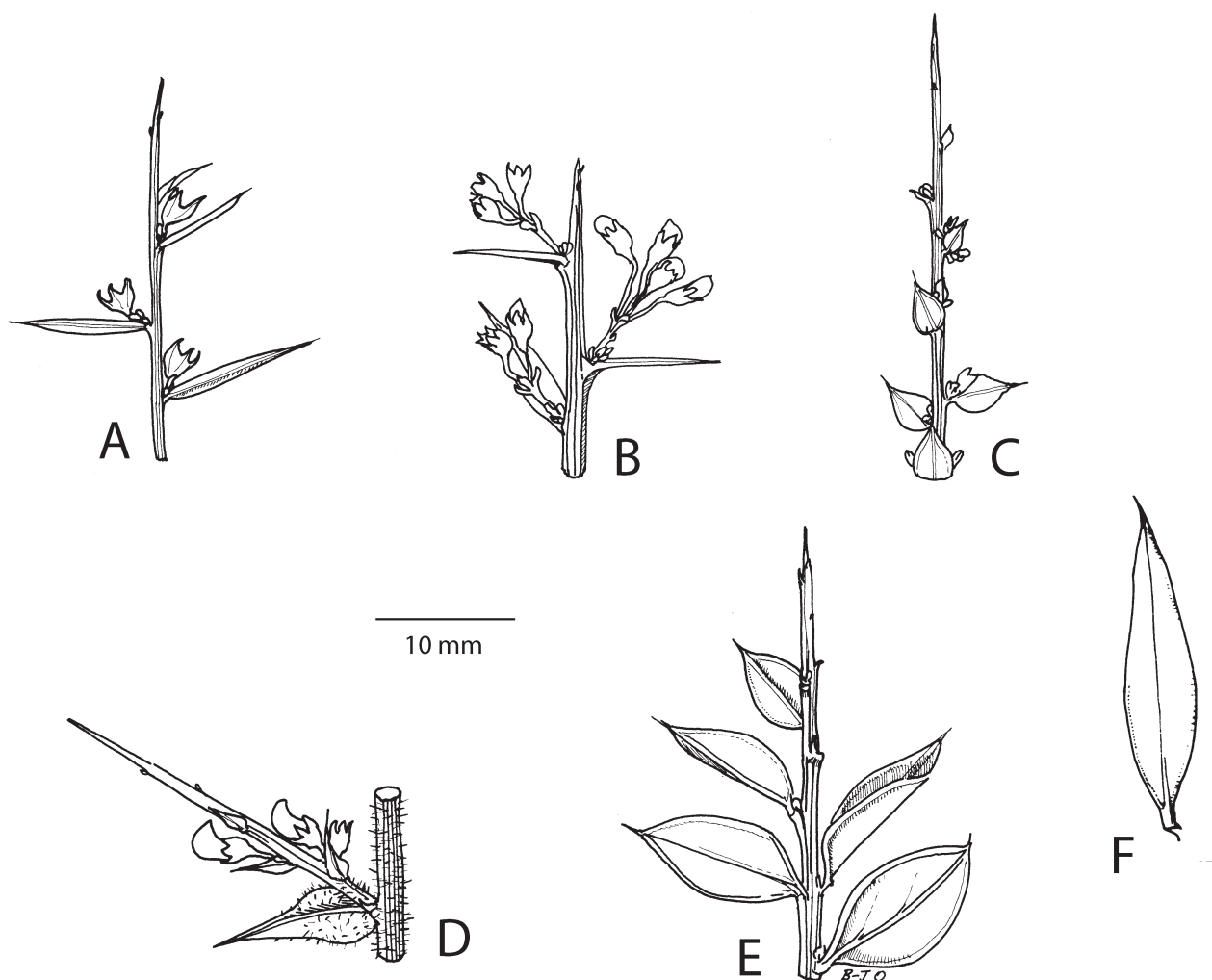
[*Daviesia umbellulata* auct. non Sm.: Candolle (1825: 114), Hooker (1856: 82). Name misapplied to material of *D. ulicifolia* Andrews.]



**FIGURE 11.** *Daviesia ulicifolia* subsp. *ulicifolia*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A, B from *Crisp* 6738; C from *Rodway* 15476. Drawn by B-J. Osborne. Adapted from Chandler and Crisp (1997), with permission from CSIRO Publishing.

Divaricate *shrubs* to 2.5 m high, glabrous or occasionally hispid on vegetative parts. *Root anatomy* normal (unistelar) in all subspecies examined. *Branchlets* spinescent, longitudinally ridged, angular-terete. *Phyllodes* scattered, divaricate to ascending, narrowly ovate to narrowly elliptic, usually rigid, 3–22 × 1–6 mm; apex

acuminate and pungent, upper face convex with midrib usually more prominent than below (sometimes equally prominent in subsp. *pilligensis*); basal node articulate. *Unit inflorescences* 1 or 2 per axil, 1-flowered or umbellate (rarely with very condensed racemes) with up to 5 flowers; *peduncle* 0–3 mm long, *rachis* 0–1.1 mm long; *subtending bracts* ascending, oblong, ca. 1 mm long. *Pedicels* cylindrical, 0.5–5 mm long. *Calyx* 2–4 mm long, including ca. 0.5–1 mm receptacle; lobes equal, triangular or narrow-triangular, incurved at margins and in profile (tips sometimes recurved), ca. 0.5–1 mm long, 10-ribbed. *Corolla*: *standard* broadly obovate, emarginate, 3–6 × 3–10 mm including the 1–2 mm claw, varying among subspecies from yellow with a small red ring surrounding a yellow centre to orange with a red ring surrounding a yellow centre; *wings* obovate to broadly so, apex rounded, auriculate to deeply so, 4–6 × 1.5–2.5 mm including the 1–2 mm claw, dark red centrally grading to yellow or orange-red (depending upon subspecies) at the margin and apex; *keel* half transversely broadly elliptic to obovate, obtuse to very acute at apex, slightly auriculate to deeply so, slightly saccate to deeply so, 4–5 × 1.5–2.5 mm including the ca. 1.5 mm claw, maroon to red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, compressed filaments and versatile or basifixed anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and basifixed, 2-celled anthers; filaments free. *Style* curving gently to sharply upwards. *Pod* obliquely shallowly obtriangular, compressed but somewhat biconvex in section, beaked with persistent style at apex, ca. 8 × 5.5 mm, light brown. *Seed* round-oblong, 3.5–4 mm long, 1.8–2 mm wide, ca. 1.5 mm thick, colour light-medium brown; *aril* round. (Figs 11, 12).



**FIGURE 12.** *Daviesia ulicifolia*, showing variation among non-typical subspecies. A. subsp. *stenophylla*. B. subsp. *aridicola*. C. subsp. *ruscifolia*, Victorian lowland form. D. subsp. *ruscifolia*, montane form. E. subsp. *pilligensis*. F. subsp. *incarnata*. Voucher details unavailable. Drawn by B-J. Osborne.

**Common names:**—Gorse Bitter-pea, Native Gorse.

**Flowering period:**—August at low elevations and latitudes to December at higher elevations and latitudes.

*Fruiting period:* September to January.

**Distribution:**—An extensive range in eastern and southern Australia, from the Great Victoria Desert in Western Australia, across the southern half of South Australia, through Victoria and Tasmania and north through eastern New South Wales to south-east and central Queensland, with a disjunct occurrence in far north Queensland.

**Affinity:**—*Daviesia ulicifolia* has affinities to *D. arthropoda*, *D. sejugata*, *D. acicularis* and *D. arenaria*, all of which belong to the Actinomorphic-calyx clade (III, Fig. 1A). Additionally, *D. microcarpa* is very similar to *D. ulicifolia*, despite not being closely related. *Daviesia acicularis* and *D. microcarpa* differ from the other species, including *D. ulicifolia*, in having multiple ascending stems with non-spinescent tips. *Daviesia microcarpa* has terete-tetragonal phyllodes, whereas *D. ulicifolia* has horizontally flattened phyllodes. *Daviesia acicularis* has toothed phyllode margins, whereas *D. ulicifolia* has entire margins. *Daviesia arthropoda* has narrowly obovate phyllodes and *D. sejugata* has narrowly elliptic to obovate phyllodes, whereas *D. ulicifolia* has basically ovate phyllodes (often narrow) that occasionally approach elliptic. Also, *D. arthropoda* and *D. sejugata* tend to have longer and broader phyllodes than *D. ulicifolia*. In *D. ulicifolia*, the calyx-lobes are incurved at the tips whereas in *D. sejugata* and *D. arthropoda* they are gently recurved. *Daviesia arenaria* has a similar phyllode shape to some forms of *D. ulicifolia* (mainly subsp. *pilligensis*), but in *D. ulicifolia* the midvein is more prominent above than below, whereas in *D. arenaria* the midvein is more prominent below. In *D. ulicifolia* subsp. *pilligensis* the midvein is more or less equally prominent above and below, but it is strictly glabrous (*D. arenaria* is usually grey-hispid).

### 10a. *Daviesia ulicifolia* subsp. *ulicifolia*

References: Chandler & Crisp (1997: 36), Crisp (2002: 528), Craigie (2015: 34.).

*Daviesia ulicina* Sm. ex Donn (1804: 76), *nom. nud.*

*Daviesia ulicina* Smith (1805: 506), Bentham (1864: 81). *Daviesia ulicina* Sm. f. *communis* Benth. (1864: 81). *Daviesia ulicina* Sm. var. *communis* (Benth.) Maiden & Betche (1916: 101). It seems likely that this infraspecific name was intended to include the type of *D. ulicina*. If so, it should be replaced by the autonym. Type: [Port Jackson]. Holotype: LINN; isotype: LIV. *Nom. superfl. and inval.*, *D. ulicifolia* Andrews (1803) is given as a synonym.

*Daviesia genistoides* Loddiges (1830a: t. 1552). Type: ‘lately introduced from New Holland’. Type specimen unknown. Holotype: the plate.

*Daviesia ulicina* Sm. f. *subumbellata* Bentham (1864: 81). *Daviesia ulicina* Sm. var. *subumbellata* (Benth.) Ewart (1907: 39). Type: ‘Victoria and Tasmania.’ Type specimen unknown. In a range of material seen by Bentham (K, MEL), it is unclear which may typify this name. Although Bentham cited *D. umbellata* Labill. in synonymy under *D. ulicina* f. *subumbellata*, the latter should be treated as a new taxon by Bentham, since Labillardière’s name is a mistake (McNeill *et al.* 2012: Art. 58)—see also discussion below under *D. umbellulata* auct. non Sm. var. *angustifolia* DC.

[*Daviesia umbellata* Labillardière (1805: t. 137), *sphalm.* Specimens cited: ‘Habitat in capite Van-Diemen.’ Specimens seen: B, BM, FI-W, G, G-DC, P, S. *Daviesia umbellulata* auct. non Sm. var. *angustifolia* Candolle (1825: 114), Don (1832: 125). Notes: See details about this misspelled and misapplied name under the synonymy of *D. ulicifolia* above.]

[*Daviesia umbellulata* auct. non Sm.: Candolle (1825: 114), Hooker (1856: 82). Name misapplied to material of *D. ulicifolia* Andrews.]

[*Daviesia umbellulata* auct. non Sm. var. *angustifolia* Candolle (1825: 114), Don (1832: 125). Type: ‘*D. umbellata* Labill! nov. holl. spec. I. p. 107 t. 137. (v.s.)’ Holotype: Nouv. Holland, Mr. Labillardière, 1808 (G-DC); isotypes: B, BM, FI-W, P, S. Candolle (1825: 114) cited *D. umbellata* Labill. in synonymy, presumably recognising Labillardière’s error in transcribing the epithet (see above). See also *D. ulicina* Sm. f. *subumbellata* Benth., immediately above.]

[*Daviesia umbellulata* auct. non Sm. var. *acuminata* Hooker (1856: 82). This appears to be an error of transcription for *D. umbellulata* auct. non Sm. var. *angustifolia* DC. because Hooker attributed the variety to Candolle (1825).]

This is the most variable subspecies of *D. ulicifolia*. It is the autonym subspecies and paraphyletic with respect to the other subspecies (Chandler & Crisp 1997) (see also the molecular phylogeny, Fig. 1A), and has no unique diagnostic characters compared with the other subspecies. Phyllodes range from short to long, but are mostly narrow. This is the only subspecies with both umbellate and 1-flowered inflorescences, however they are never racemose. The standard is mostly yellow, ranging from small (as in subsp. *stenophylla*) to large (as in subsp. *ruscifolia*).

*Shrubs* to 2.5 m high. *Root anatomy* normal (unistelar). *Phyllodes* narrow-ovate or -elliptic, 4–20 × 1–3 mm; upper face convex with midrib more prominent than below. *Unit inflorescences* 1 or 2 per axil, 1-flowered or umbellate with up to 5 flowers; *peduncle* 0–3 mm long. *Pedicels* 0.5–5 mm long. *Calyx* 2–3 mm including the 0.5–



1 mm receptacle. *Corolla: standard* ca. 3–6 × 3.5–9 mm including the ca. 1–2 mm claw, yellow with dark red markings; *wings* base auriculate, 5–6 × 2 mm including the ca. 1–2 mm claw, dark red centrally grading to yellow at the margins and apex; *keel* apex not acute to acute, 4–5 × 2 mm including the ca. 1.5 mm claw, ± deep red. (Fig. 11).

**Flowering period:**—Late August through to November. *Fruiting period:* September to December.

**Distribution:**—South-east Queensland, eastern New South Wales, most parts of Victoria and Tasmania, and south-eastern South Australia.

**Habitat:**—Varied, from rocky hill slopes in western New South Wales and the Grampians to rich coastal loams on the New South Wales coast and around Portland in Victoria. Vegetation is generally dry sclerophyll forest dominated by *Eucalyptus*.

**Selected specimens (70 examined):**—**SOUTH AUSTRALIA. South East:** 10 km NNW of Millicent, 37°31'S, 140°17'E, *P.G. Wilson 1077*, 10 November 1959 (AD, B, E, M, SI, TI). **NEW SOUTH WALES. South Coast:** Ca. 2 km N of Bewong Roadhouse, 35°05'S, 150°32'30'E, *G.T. Chandler 47*, 27 August 1994 (CANB); 0.5 km S of East Lynne, 35°37'S, 150°15'E, *M.D. Crisp 6738*, 4 October 1980 (CBG, GAUBA); Nowra, 34°53'S, 150°36'E, *F.A. Rodway 15476*, 13 November 1951 (NSW). **Southern Tablelands:** 12.5 km E Hoskinstown towards Braidwood, 35°27'S, 149°34'E, *G.T. Chandler 142*, 26 November 1994 (CANB). **Northern Tablelands:** Dawson's Spring, Mt Kaputar National Park [38 km ENE Narrabri], 30°17'S, 150°10'E, *R. Coveny 8698 & S.K. Roy*, 17 November 1976 (NSW). **Central-west Slopes:** 41 km W of West Wyalong, 33°53'S, 146°47'E, *G.M. Cunningham & P.L. Milthorpe s.n.*, 17 August 1976 (CBG 8906608). **VICTORIA. Western Highlands:** Grampians, 1 km above Silverband Falls, 37°10'S, 142°31'E, *R. Melville 1774*, 28 October 1952 (AD, BRI, K, MEL, NSW); Grampians National Park, Mirranatwa Gap, 44 km from Cavendish towards Halls Gap, 37°25'34'S, 142°27'26'E, *G.T. Chandler 115*, 18 October 1994 (CANB). **TASMANIA.** Orford, *F. Hood 13*, September 1932 (HO).

**Affinity:**—*Daviesia ulicifolia* subsp. *ulicifolia* is highly variable in overall morphology, and can be divided into approximate geographic forms. In particular, plants in the west and south (and from Mt Kaputar in northern NSW) have consistently umbellate inflorescences, while plants in the east and north mostly have 1-flowered inflorescences. The coastal form of New South Wales and eastern Victoria most closely resembles subsp. *stenophylla*, with fairly narrow ovate phyllodes and flowers solitary or in pairs in the axils. The subumbellate-inflorescence form of subsp. *ulicifolia* (Chandler & Crisp 1997) resembles *D. ulicifolia* subsp. *incarnata* but in the latter the standard is red-orange whereas in subsp. *ulicifolia* it is yellow. Plants from western New South Wales (e.g. West Wyalong) resemble subsp. *pilligensis*, but the latter has broad phyllodes, to 6 mm wide, grows in deep sand, has conspicuous lateral venation and the midrib is about equally prominent above and below.

**10b. *Daviesia ulicifolia* subsp. *stenophylla*** Chandler & Crisp (1997: 42), Crisp (2002: 528). Type: New South Wales, North Coast, 52 km from Clarence River crossing at Grafton towards Casino along the Cummerland Highway, 29°17'30'S, 152°59'40'E, *G.T. Chandler 75*, 6 September 1994. Holotype: CANB; isotypes: BRI, NSW

*Daviesia ulicina* Sm. f. *angustifolia* Benth (1864: 81). Type: 'Queensland and N. S. Wales.' Type: In a range of specimens seen by Benth (K, MEL), it is unclear which typifies this name. This is not the same taxon as *D. umbellulata* auct. non Sm. var. *angustifolia* DC., which is based on *D. umbellata* Labill. We know this because Benth (1864: 81) placed *D. umbellata* Labill. as a synonym of his taxon *D. ulicina* f. *subumbellata* (= *D. ulicifolia* subsp. *ulicifolia* in the present treatment—see above).

*Daviesia ulicina* Sm. var. *angustifolia* Bailey & Tenison-Woods (1880: 149), *nom. nud. & inval.*

*Daviesia ulicina* Sm. var. *angustifolia* Bailey (1883: 90). Type: 'The common form about Brisbane.' Type: Unknown.

*Shrubs* rather delicate and not rigid. *Phyllodes* slender, linear-elliptic to slightly linear-ovate, 8–20 × 0.5–1.5 mm; upper face convex with midrib more prominent than below. *Unit inflorescences* 1 or 2 per axil, 1-flowered; *peduncle* nil. *Pedicels* 0.7–2.5 mm long. *Calyx* 3–3.5 mm long including the ca. 0.5 mm receptacle. *Corolla: standard* 6–7 × 5–6.5 mm including the ca. 2 mm claw, bright yellow infused with red which darkens toward the yellow centre; *wings* deeply auriculate, 4–5.5 × 2 mm including the ca. 1.5 mm claw, dark red centrally grading to orange or yellow at the margins and apex; *keel* very acute, auriculate, 4 × 2 mm including the ca. 1 mm claw, maroon or dark red. (Fig. 11A).

**Flowering period:**—August and September. *Fruiting period:* September and October, also November in the southerly limits.

**Distribution:**—Disjunct in far north Queensland (western side of the wet tropics ranges) and then more or less continuous from central Queensland to the Central Coast of New South Wales (rarely on the South Coast of NSW). Predominantly coastal, this subspecies occasionally occurs inland, e.g. the Pilliga Scrub of New South Wales and central Queensland ranges.

**Habitat:**—Mostly growing in coastal sandy or clay loams, though further inland the soils tend to be rockier. Vegetation is varied, though this subspecies grows vigorously in disturbed sites such as road and power line clearings.

**Selected specimens (25 examined):**—**QUEENSLAND. Maranoa:** 6 km E of Yuleba, Warrego Hwy, 26°37'S, 149°26'E, *M.D. Crisp 11741*, 3 September 2016 (BRI, CANB). **Wide Bay:** 2.5 km from Bruce Highway towards Caloundra, turnoff on S side of road, 26°46'45'S, 153°03'45'E, *G.T. Chandler 81*, 7 September 1994, (CANB, BRI). **Cook:** Mt Windsor Tableland, 16°26'S, 145°11'E, *B.L. Hyland 4888*, 19 June 1969 (QRS). **NEW SOUTH WALES. North Coast:** 4 km S Buladelah along Pacific Highway, near rest area on side of road, 32°26'30'S, 152°11'30'E, *G.T. Chandler 62*, 5 September 1994, (CANB, NSW). **Central-west slopes:** Goonoo State Forest, ca. 8 km E of Moriguy, 32°04'S, 148°43'E, *E.F. Constable 21*, 9 December 1961 (NSW, NT, PERTH).

**Affinity:**—This subspecies most closely resembles *D. ulicifolia* subsp. *ulicifolia* (east coastal form) but the phyllodes are narrower and often longer and the flowers slightly smaller. The whole aspect of the plant is rather slender, and the shrubs are distinctly soft compared with the fierce rigidity of the other subspecies. By contrast, subsp. *ruscifolia* has ovate phyllodes that are wide at the base, subsp. *incarnata* has longer and wider phyllodes and subsp. *aridicola* has very thick, rigid, glaucous phyllodes. Also, subsp. *incarnata* and subsp. *aridicola* have umbellate or racemose inflorescences, whereas subsp. *stenophylla* has flowers solitary or in pairs in the axils. Subsp. *stenophylla* has small flowers, as does subsp. *ulicifolia* and subsp. *aridicola*, but subsp. *ruscifolia* and subsp. *incarnata* have very large flowers, which also have a red or orange standard, in contrast to yellow in the other subspecies.

**10c. *Daviesia ulicifolia* subsp. *ruscifolia*** (A.Cunn. ex Benth.) Chandler & Crisp (1997: 44), Crisp (2002: 528). *Daviesia ruscifolia* A.Cunn. ex Benth. (1837a: 11), Benth. (1839: 75). *Daviesia ulicina* Sm. f. *ruscifolia* (A.Cunn. ex Benth.) Benth. (1864: 81). *Daviesia ulicina* Sm. var. *ruscifolia* (A.Cunn. ex Benth.) Black (1924: 296)—name misapplied to material of *D. arenaria*. Type: 'Nova Cambria australis, A. Cunningham.(v.s.)' Holotype: Bushy sandstone ridge SW from Lake George, SW interior of N.S. Wales, *A. Cunningham 64*, April 1824 (W); isotypes: BM, CANB, CGE, K (2 sheets), NY). Though the type appears to be juvenile, there is no doubt it belongs to this taxon

*Shrubs* 0.2–1.7 m high, sometimes observed suckering from roots. *Root anatomy* unknown. *Phyllodes* ovate or somewhat narrow, wide at the base, 5–12 × 1.5–4.5 mm; upper face convex with midrib more prominent than below. *Unit inflorescences* 1 or 2 per axil, 1-flowered; *peduncle* nil. *Pedicels* 0.5–4 mm long. *Calyx* 2–3 mm long including the 0.5–1 mm receptacle. *Corolla: standard* very broad-obovate with a deep sinus at the apex, 4–9 × 5–10 mm including the ca. 1–2 mm claw, orange with dark red markings; *wings* deeply auriculate, 4–6 × 2 mm including the ca. 1–2 mm claw, dark red centrally grading to orange-red at the margins and apex; *keel* acute, saccate, slightly auriculate, 3–5 × 1–1.5 mm including the ca. 1–1.5 mm claw, dark red. (Fig. 11C, D).

**Flowering period:**—Late October to early January. **Fruiting period:** December and January, rarely February.

**Distribution:**—Mostly at higher elevations in the Great Dividing Range from central New South Wales to the Grampians in western Victoria; also at lower elevations in Tasmania and Victoria.

**Habitat:**—Dry sclerophyll (eucalypt) forest, usually on hills and ridge crests, occasionally in lower-lying areas in Victoria. Often occurring on rocky sites or alpine loam soils.

**Selected specimens (36 examined):**—**NEW SOUTH WALES. Southern Tablelands:** Namadgi National Park, 9.6 km from the second crossing of the Gudgenby River within the Park along Bobyan Road, 35°49'30'S, 149°00'30'E, *G.T. Chandler 147*, 29 November 1994 (CANB). **VICTORIA. Eastern Highlands:** Native Dog Flat, Buchan River crossing, 36°53'49'S, 148°05'17'E, *G.T. Chandler 156*, 10 December 1994 (CANB). **Northern Plains:** Whipstick Scrub, N of Bendigo, 3.2 km along Skylark Road from intersection with Loeser Road, *G.T. Chandler 125*, 18 October 1994 (CANB). **Western Highlands:** Mt Cole Plateau, 100 m N of summit of Mt Bangor, 37°18'S, 143°13'E, *M.D. Crisp 8321 & J.M. Taylor*, 28 November 1989 (CBG, MEL, NSW). **TASMANIA.** Grass Tree Flats, *F.H. Long 598*, 13 November 1931 (HO).

**Affinity:**—This subspecies most closely resembles the inland New South Wales form of *D. ulicifolia* subsp. *ulicifolia*, with the phyllodes and inflorescences similar, though those of subsp. *ulicifolia* are generally narrower at the base, and the standard is yellow and smaller. Also similar in phyllode shape to subsp. *pilligensis* but the latter differs in having a predominantly yellow standard, visible venation, and the midrib more or less equally prominent on both surfaces. The phyllodes do not resemble those of subsp. *stenophylla*, subsp. *aridicola* or subsp. *incarnata*.

**10d. *Daviesia ulicifolia* subsp. *pilligensis*** Chandler & Crisp (1997: 45), Crisp (2002: 528). Type: New South Wales, Central-west slopes, Goonoo State Forest, 15 km from Mendooran along road to Dubbo, 31°55'S, 149°01'E, *M.D. Crisp 3272* & *D. Verdon*, 4 October 1977. Holotype: CANB; isotype: NSW

Open-crowned *shrubs* to 3 m high, glabrous. *Root anatomy* normal (unistelar). *Phyllodes* elliptic to ovate, 7–20 × 2–5(–7) mm, flat to undulate or twisted, sometimes slightly concave above; midvein ca. equally prominent above and below; secondary venation visible in fresh leaves. *Unit inflorescences* solitary or in pairs in the axils, 1-flowered. *Pedicels* 1.5–2.5 mm long. *Calyx* 2–3 mm long including the 0.5–1 mm receptacle; upper 2 lobes slightly broader than the lower 3. *Corolla: standard* elliptic, claw broader and cuneate, 5–6 × 4.5–5.5 mm including the ca. 1.5 mm claw, yellow with red markings; *wings* deeply auriculate at the base, ca. 4.5 × 1.5 mm including the ca. 1.5 mm claw, dark red centrally grading to yellow at the margins and apex; *keel* saccate and auriculate at the base, ca. 4 × 1.5 mm including the ca. 1.5 mm claw, dark red. (Fig. 11E).

**Flowering period:**—August to November. *Fruiting period:* October to December.

**Distribution:**—From the Darling Downs, south-east Queensland, to the western slopes of New South Wales, especially the Pilliga Scrub.

**Habitat:**—Grows in deep sandy soil in the heath understorey of woodland and open forest with *Callitris*, *Eucalyptus* and *Acacia* dominating the overstorey.

**Selected specimens (17 examined):**—**QUEENSLAND. Darling Downs:** Bybera, between Inglewood and Milmerran, 28°16'S, 150°49'E, *C.T. White 12612*, 20 September 1944 (BRI, CANB); Western Creek State Forest, ca. 37 km W of Milmerran, 27°53'S, 150°53'E, *M.D. Crisp 11677*, 11 April 2015 (BRI, CANB). **NEW SOUTH WALES. North-west Slopes:** 9.7 km Coonabarabran to Narrabri road, 31°12'S, 149°19'E, *G.W. Althofer s.n.*, October 1977 (NSW 141275); Yetman, and 8 km E of Warialda, 28°54'S, 150°46'E, *V.E. Sands 628.8.1*, 8 August 1962 (PERTH, SYD). **North-western Plains:** Pilliga scrub, 6 km from Pilliga towards Baradine, 30°24'20"S, 148°58'E, *G.T. Chandler 86*, 9 September 1994 (CANB, NSW). **Central western Slopes:** Goonoo State Forest, 15 km from Mendooran along road to Dubbo, 31°55' S 149°01' E, *M.D. Crisp 3271* & *D. Verdon*, 4 October 1977 (CBG, MEL).

**Affinity:**—Like *D. arenaria*, this subspecies grows on deep sand and can have a similar phyllode shape, i.e. ovate; however, the midrib of the phyllode in *D. arenaria* is prominent only on the abaxial surface and the standard is orange, not yellow. *Daviesia ulicifolia* subsp. *pilligensis* is similar in phyllode shape to subsp. *ruscifolia*, but the latter differs in having an orange standard, obscure secondary venation (except in dried phyllodes), and the midrib is more prominent on the adaxial surface. Plants of subsp. *ulicifolia* from western New South Wales (e.g. West Wyalong) resemble subsp. *pilligensis*, but the latter has broader phyllodes, grows in deep sand, has conspicuous lateral venation and the midrib is about equally prominent above and below.

**10e. *Daviesia ulicifolia* subsp. *aridicola*** Chandler & Crisp (1997: 39: 528), Craigie (2015: 33), Crisp (2002: 528). Type: South Australia, North-West, ca. 5 km N of Ooldea, 30°25'S, 131°50'E, *P.G. Wilson 1789*, 20 September 1960. Holotype: AD; isotypes: E, SI

*Shrubs* with glaucescent vegetative parts. *Root anatomy* unknown. *Branchlets* prominently ribbed and very rigid, ascending, glabrous. *Phyllodes* narrowly ovate, truncate at base, 8–17.5 × 1.3–2.5 mm; upper face convex with midrib more prominent than below. *Unit inflorescences* umbellate or shortly racemose 1(2) per axil, 2–7-flowered; *barren basal bracts* imbricate; *subtending bracts* foliose, 1–2 mm long; *peduncle* 0.7–2 mm long, *rachis* 0.1–1.1 mm long. *Pedicels* 1–4 mm long. *Calyx* 2.3–3.5 mm long including the 0.8–1 mm receptacle, faintly to prominently ridged; upper lobes united higher than lower 3, lower lobes acute, all minutely ciliate on the margins. *Corolla: standard* broader than long with a shallow apical sinus, ca. 2.8–3.2 × 3.5–4 mm including the 1.3–2 mm claw, darkish red centrally grading to orange at the margins and apex; *wings* auriculate, ca. 4 × 1.4 mm including

the 1.5–2 mm claw, red centrally grading to orange at the margins; *keel* ca. 4 × 1.5–2 mm including the 1.5 mm claw, slightly auriculate, moderately saccate, slightly acute to acute, dark red. (Fig. 11B).

**Flowering period:**—May to November. *Fruiting period:* Unknown.

**Distribution:**—Great Victoria Desert (Western Australia and South Australia) to northern Eyre Peninsula, far south-western New South Wales and far north-western Victoria. These are the western-most populations of the species, as well as being in the most arid, inland habitats. Although widespread, this subspecies appears to be uncommon in the field.

**Habitat:**—On deep sandy soil (dunes) in arid areas with mallee eucalypts over shrubs (e.g. *Acacia* and *Triodia*).

**Selected specimens (13 examined):**—**WESTERN AUSTRALIA.** Helms: 12 km S of Neale Junction, 28°22'S, 125°28'E, *H.R. Toelken*, 6 September 1979 (AD, CANB); ca. 130 km E of Laverton, 12.5 km W along White Cliffs Road from Yamarna homestead ruins, 28°14'S, 123°35'E, *M.D. Crisp 11297*, 8 September 2012 (CANB). **SOUTH AUSTRALIA. Eyre Peninsula:** Lake Everard, ca. 31°30'S, 135°15'E, *W.S. Reid s.n.*, 31 March 1960 (AD); Murray Basin: 13 km NNE of Renmark, 2.5 km SW of Murtho Park, 34°04'S, 140°49'E, *M.D. Crisp 6975*, 25 November 1980 (CBG, MEL). **NEW SOUTH WALES: South Far Western Plains:** 36 km S of Pooncarie, ca. 33°40'S, 142°25'E, *Anon. s.n.* (NT 45679).

**Affinity:**—*Daviesia ulicifolia* subsp. *aridicola* has very thick, glaucescent phyllodes, ca. 0.4–0.6 mm thick, whereas other subspecies of *D. ulicifolia* have thinner phyllodes, ca. 0.2–0.4 mm thick, that are not glaucous. In inflorescence structure and flower colour, this subspecies most closely resembles subsp. *incarnata*, which differs in only occasionally having racemose inflorescences, most being umbellate. *Daviesia ulicifolia* subsp. *aridicola* also resembles subumbellate-inflorescence form of subsp. *ulicifolia* (Chandler & Crisp 1997), e.g. from western Victoria, but the standard and wing petals of subsp. *aridicola* are orange marginally with dull red central markings, as opposed to the yellow with dark red markings in subsp. *ulicifolia*.

**10f. *Daviesia ulicifolia* subsp. *incarnata*** Chandler & Crisp (1997: 40), Craigie (2015: 33). Type: South Australia, Southern Lofty Ranges, Cleland Conservation Park, Perimeter Track, 34°57'54"S, 138°41'37"E, *G.T. Chandler 96*, 13 October 1994. Holotype: CANB; isotypes: AD, K

*Shrubs* to 1.8 m high, glaucescent to pruinose. *Root anatomy* unknown. *Branchlets* flattened or angular. *Phyllodes* more prevalent towards branchlet apex, narrow-elliptic, -ovate or linear, 9.5–22 × 1–3(–5) mm, twisted at base; upper face convex with midrib more prominent than below. *Unit inflorescences* 1 or 2 per axil, umbellate or rarely racemose, 2–5-flowered; involucre of basal *bracts* present, prominent, imbricate, keeled, 1–2 mm long; *peduncle* 0.2–3.5 mm long; *rachis* 0–0.2 mm long. *Pedicels* 1–3.5 mm long. *Calyx* ca. 3.5 mm long including the 0.5–1 mm receptacle, faintly to prominently ribbed, campanulate, upper lobes united slightly higher, all lobes acute, minutely ciliate at margins. *Corolla: standard* broadly obovate to broadly elliptic, emarginate, 7–8 × 7.5–9.5 mm including the ca. 1–2 mm claw, deep red-orange with a dark red band circling the yellow centre; *wings* deeply auriculate, ca. 6–7 × 2–3 mm including the ca. 2 mm claw, maroon centrally grading to orange-red at the margins and apex; *keel* acute, slightly auriculate, ca. 5–6 × 2–3 mm including the ca. 2 mm claw, deep red. (Fig. 11F).

**Flowering period:**—late September to early November. *Fruiting period:* October to November.

**Distribution:**—Endemic to South Australia, where it extends throughout the Mt Lofty Range, with isolated records from Yorke Peninsula, the southern Flinders Ranges and Kangaroo Island.

**Habitat:**—Sandy to rich loamy soils, in undulating hilly to mountainous country. The vegetation is varied, usually *Eucalyptus*-dominated sclerophyll communities, often with other legume species.

**Selected specimens (15 examined):**—**SOUTH AUSTRALIA. Lofty South:** Blewitt Springs, 35°10'S, 138°36'E, *R. Filson 3094*, 4 September 1960 (CANB, MEL); 2.5 km E of Clarendon town centre towards Kangarilla at the intersection of Grants Gully Road and Bakers Gully Road, 35°07'33"S, 138°38'29"E, *G.T. Chandler 112*, 16 October 1994 (CANB). **Flinders Ranges:** Mt Charles, ca. 30 km NE of Port Pirie, ca. 33°07'S, 138°09'E, *M. Sharrad 1460*, 23 September 1967 (AD).

**Affinity:**—This subspecies resembles the subumbellate-inflorescence form of *D. ulicifolia* subsp. *ulicifolia* and both subspecies also share relatively large standards and phyllodes. However, *D. ulicifolia* subsp. *incarnata* has a rosy red to deep orange-red standard, whereas subsp. *ulicifolia* has a mostly yellow standard. Some inflorescences of subsp. *incarnata* are slightly racemose, resembling those of subsp. *aridicola*, which also has a similar flower colour, though the standard is much larger in subsp. *incarnata*.

#### IV. *D. reclinata* Clade

11. *Daviesia reclinata* A.Cunn. ex Bentham (1864: 77), Crisp (1992: 390), Crisp (1995: 1228). Type: 'N. Australia. Arnhem N. Bay, R. Brown; Sims Island, A. Cunningham.' Lectotype (Crisp 1995: 1228): 'Sims's Isld., N.C.', *A. Cunningham* (K: Herb. Hooker, annotated 'reclinata sp. n.' by Bentham). Syntype: 'Arnhem N. Bay, February 16 1803', *R. Brown* (BM, annotated by Bentham). Other specimens which may be isoelectotypes: Sims' Island, 1st Voyage of 'Mermaid', *A. Cunningham* 257, 1818 (BM, CANB, E, K, NSW); Sims' Island, 3rd Voyage of 'Mermaid', *A. Cunningham* 50, 1820 (BM, CANB, NSW); Sims Island, *A. Cunningham* (K: Herb. Hooker, not annotated by Bentham); North Coast, New Holl., *A. Cunningham* (MEL)

Prostrate or straggling *shrubs* to m high and 2 m broad, glabrous. *Root anatomy* unknown. *Branchlets* lax, angular or compressed, triquetrous, ribbed. *Phyllodes* scattered, spreading to ascending, linear-elliptic, sometimes reduced to scales, acute or rarely obtuse, basally articulate and decurrent, 10–150 × 1–6(–8) mm, green; midrib and marginal nerves prominent; lateral veins numerous, longitudinal, anastomosing, conspicuous. *Unit inflorescences* axillary or terminal, racemose, with 5–10 widely spaced flowers, occasionally forming panicles with each constituent raceme subtended by a reduced leaf or bract; axillary racemes with *peduncle* 6–110 mm long and *rachis* triquetrous, 10–140 mm long; panicle branches, when present and determinate, with a *peduncle* 10–40 mm long and *rachis* 8–63 mm long; terminal inflorescences with indefinite peduncle and rachis, sometimes encompassing the entire seasonal growth of a branchlet; *subtending bracts* appressed, deltoid, keeled, ca. 0.75 mm long; *barren bracts* not forming a basal cluster, scattered, few. *Pedicels* 2.5–6.5 mm long. *Calyx* campanulate, 4–5 mm long, prominently 5–10-ribbed, slightly viscid and glossy, abruptly contracted to the 1.5–2 mm stipe-like receptacle, enlarging in fruit to 6–8 mm long and becoming scarious; upper 2 lobes oblong, ca. 2.5 mm long; lower 3 lobes deltoid, 1.5–2 mm long. *Corolla* pure yellow, occasionally infused with orange towards the centre of the standard; *standard* strongly reflexed, very broadly ovate, retuse, cordate, 7–8.5 × 6–7 mm including the 2–3 mm claw, with 2 calli at base of the lamina; *wings* narrowly obovate, apically incurved, auriculate, ca. 7 × 3 mm including the 2 mm claw; *keel* half broadly ovate, falcate, acute, slightly auriculate, saccate, ca. 6 × 2 mm including the 1.5 mm claw. *Stamens* weakly dimorphic: anthers 2-celled and basifixed; inner whorl of 5 with subterete filaments and compressed-ovoid anthers; outer whorl of 5 with compressed, longer filaments and narrowly ellipsoid anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate and beaked, compressed, 10–13 × 5–7 mm including the long beak, smooth, glossy yellow-brown; upper suture gently sigmoid; lower suture acute but broadly curved. *Seed* ellipsoid, ca. 4 mm long, ca. 2.5 mm broad, ca. 2 mm thick, brown with fine black mottling; *aril* raised at centre, tapering to compressed, frilly margins, ca. 2 mm long. (Fig. 13).

**Flowering and fruiting period:**—Any time of the year, perhaps with a peak in the winter dry season. Most specimens bear both flowers and fruits.

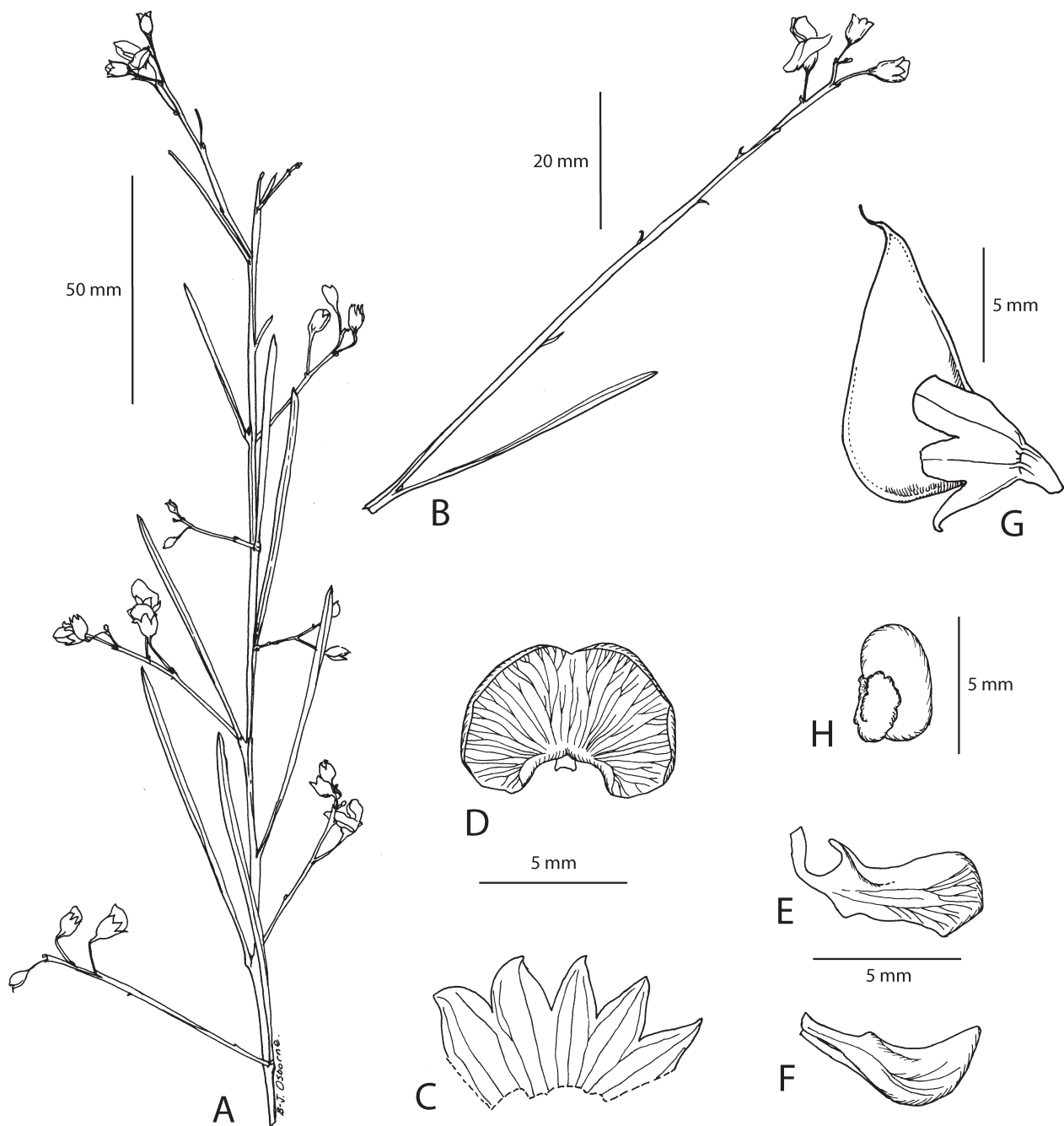
**Distribution:**—Disjunct in the Kimberley (WA) and Top End (NT). In the Northern Territory, *D. reclinata* extends throughout Arnhem Land, as well as offshore islands and east to the coast and islands of the Gulf of Carpentaria. The only two known Kimberley populations occur in the Prince Regent River and Kalumburu regions. Populations on Cape York Peninsula (Qld) previously attributed to this species have been described as *D. flava*.

**Habitat:**—Skeletal stony or sandy soils derived from sandstone, in open forest or woodland dominated by eucalypts such as *E. miniata* A.Cunn. ex Schauer (1843: 925) and *E. tetradonta* Mueller (1859a: 97), or in shrubland dominated e.g. by *Calytrix* Labillardière (1806: t. 146) and *Verticordia* Candolle (1828: 3), or in grassy savannah woodland (*Lazarides* 7992) dominated by *Pandanus* Parkinson (1773: 46) and *Syzygium* Gaertner (1788: 166).

**Selected specimens (48 examined):**—**WESTERN AUSTRALIA.** **Gardner:** Between Calder and Prince Regent Rivers, *C.A. Gardner s.n.*, 23 June 1921 (PERTH 2730227); Blyxa Ck, Prince Regent River Reserve, 15°48'S, 125°20'E, *A.S. George* 12520, 21 August 1974 (PERTH 2730227). **NORTHERN TERRITORY.** **Darwin & Gulf:** Ca. 32 km S of Oenpelli Mission, *N. Byrnes* 1967, 15 September 1970 (CANB, DNA); 12°34'S, 133°18'E, *M. Lazarides* 7568 (BRI, CANB, DNA, MEL); ca. 27 km N of Mt Evelyn, 13°21'S, 132°54'E, *M. Lazarides* 7992, 3 March 1973 (BRI, CANB); 8 km E of Goyder River crossing, 12°51'S, 135°05'E, *J.R. Maconochie* 1488, 17 June 1972 (DNA, PERTH); Elcho Island, 12°01'S, 135°37'E, *J.R. Maconochie* 2169, 10 July 1975 (CANB, DNA); Gove, 12°15'S, 136°43'E, *R.L. Specht* 939, 22 August 1948 (AD, BRI, CANB, MEL, NSW); 19 km SSW of Jabiru, 12°54'S, 132°52'E, *I.R. Telford* 7857 & *J.W. Wrigley*, 20 April 1980 (CBG, DNA,

MO, NSW, PERTH); Kakadu National Park, 2 km NNW of Koongarra Saddle, 12°45'S, 132°55'E, I.R. Telford 8140 & J.W. Wrigley, 24 April 1980 (CBG).

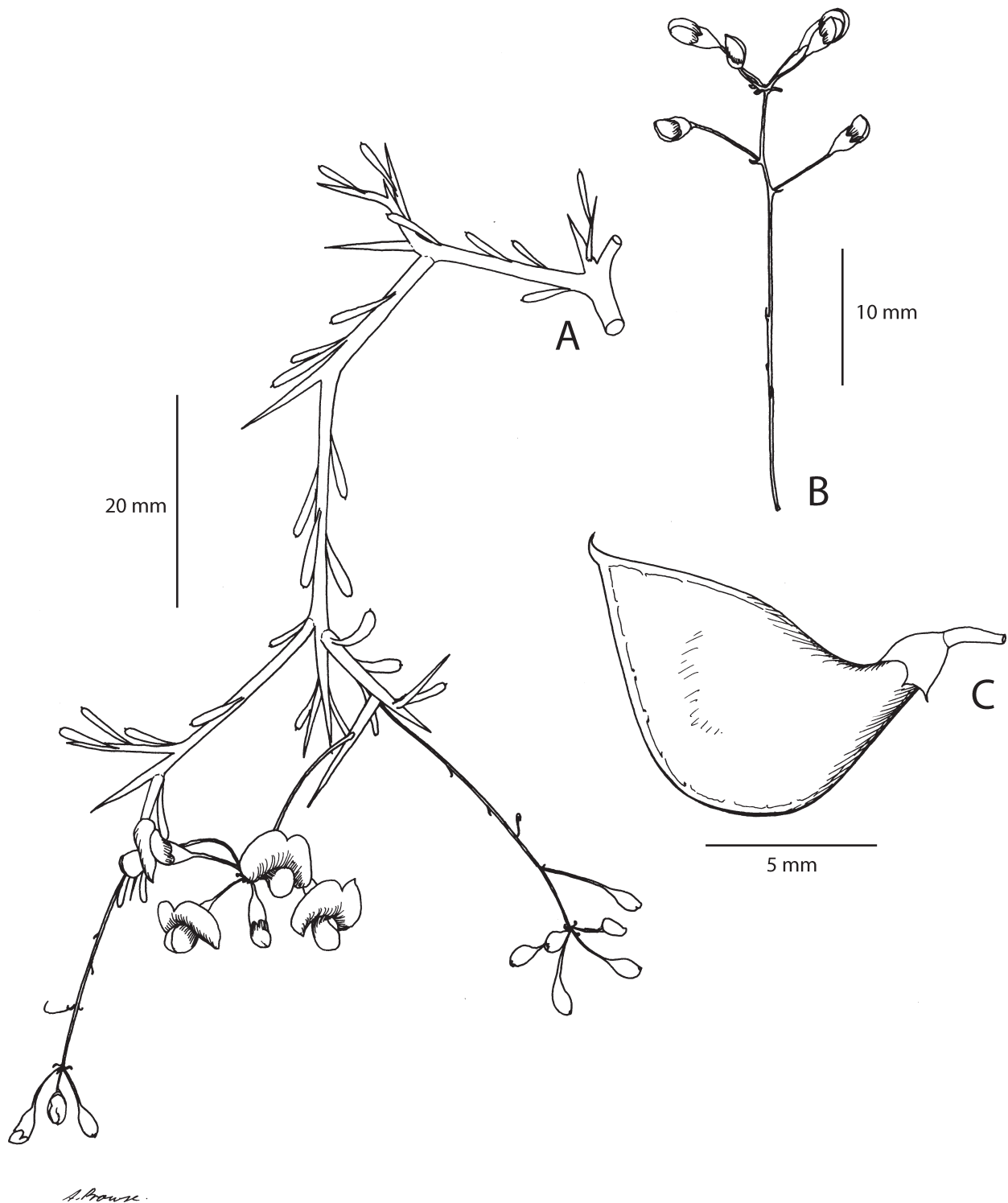
**Affinity:**—The most similar species is *D. flava* from the Cook and Kennedy North Districts of north Queensland, which used to be included in *D. reclinata*, though these species are not closely related (Fig. 1A). *Daviesia flava* resembles *D. reclinata* in general aspect, phyllodes, inflorescence, flower (including colour) and fruit morphology. It differs in having often broader phyllodes (to 15 mm), shorter somewhat corymbose racemes (rachis 10–40 mm), smaller flowers (e.g. calyx ca. 2.5 mm long), and the calyx is not noticeably accrescent in fruit. *Daviesia longifolia*, *D. pauciflora* and *D. costata* are also similar but all are restricted to south-west WA, have smaller inflorescences, petals with red markings and calyces that are not accrescent in fruit.



**FIGURE 13.** *Daviesia reclinata*. A. Flowering branchlet. B. Inflorescence. C. Calyx opened out, upper lobes at left. D. Standard. E. Wing. F. Keel. G. Pod with enlarged calyx. H. Seed with frilly aril. A, C–F from Telford 7857; B, G from Telford 8140; H from George 12520. Drawn by B.-J. Osborne and M.D. Crisp.

**V. *D. divaricata* Clade**

12. *Daviesia bursarioides* Crisp (1995: 1178). Type [approximate locality data given because the species is rare]: Western Australia, Irwin, near Three Springs, *M.D. Crisp 6480*, 16 July 1980. Holotype: CBG; isotypes: K, PERTH



**FIGURE 14.** *Daviesia bursarioides*. A. Flowering branchlet. B. Inflorescence in bud. C. Pod. A, B from *Crisp 6480* (holotype); C from *Crisp 6317*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Straggling *shrubs* to 2 m high, glabrous. *Root anatomy* unknown. *Branchlets* regularly divaricate at 45°, terete, striate, spinescent, pruinose. *Phyllodes* scattered, spreading or ascending, compressed or flattened horizontally,

narrowly obovate, apiculate, tapered to the articulated base, 3–20 × 0.75–2.5 mm, with obscure midrib and veins, rather fleshy, glaucescent. *Unit inflorescences* 1 per axil, subumbelliform (apically umbelliform, basally racemiform), 3–8-flowered, very diffuse, viscid on rachis, pedicels and bracts; *peduncle* 18–35 mm long; *rachis* from almost nil to 14 mm long; *subtending bracts* spreading or appressed, linear, ca. 1.5 mm long. *Pedicels* gently thickened upwards, constricted just below apex, 3–5 mm long. *Calyx* ca. 4 mm long including the 1–1.5 mm stipe-like receptacle, slightly 5-ribbed when dry, viscid; lobes subequal, depressed-triangular, apiculate, ca. 0.5 mm long. *Corolla: standard* strongly reflexed, broad-, very broad- or depressed-ovate, emarginate, 7.5–10 × 9–10 mm including the ca. 1.5 mm claw, with 2 thickened calli at the base of the lamina, yellow towards margins, maroon on veins and towards centre; *wings* obovate, rounded and incurved at apex, strongly auriculate, saccate, 6.5–7 × 3–3.5 mm including the 1.5–2 mm claw, deep pink; *keel* half broadly obovate, acute, scarcely auriculate or auricles absent, saccate, 5.5–6.5 × 2–2.5 mm including the 1.5–2 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with compressed filaments and versatile, very broad-ovoid anthers with confluent thecae; outer whorl of 5 slightly longer, with compressed filaments and basifixed, broad-ellipsoid, 2-celled anthers; filaments free. *Pod* obliquely very broadly to shallowly obtriangular, acuminate, compressed, stipe-like at base, 10–14 × 6–9 mm, coriaceous; upper suture barely sigmoid; lower suture acute but very broadly rounded. *Seed* broadly ellipsoid, slightly flattened, 4.5–5.2 mm long, 3–3.8 mm broad, 2–2.5 mm thick, orange-brown with black mottling; *aril* thickly lobed, ca. 2 mm long, creamy-white. (Fig. 14).

**Flowering period:**—June to September. *Fruiting period:* August to December.

**Distribution:**—Localised around the Three Springs area in Western Australia.

**Habitat:**—In sandy gravelly lateritic clay on low rises in an undulating landscape. Vegetation is mallee shrubland dominated e.g. by *Eucalyptus gittinsii* Brooker & Blaxell (1978: 228), *Allocasuarina campestris* (Diels in Diels & E. Pritzel 1904: 126) Johnson (1982: 74) and *Banksia* Linnaeus f (1782: 15).

**Conservation status:**—National: Endangered. WA: Critically Endangered, Declared Rare Flora.

**Selected specimens (14 examined):**—Approximate locality data are given because the species is rare.

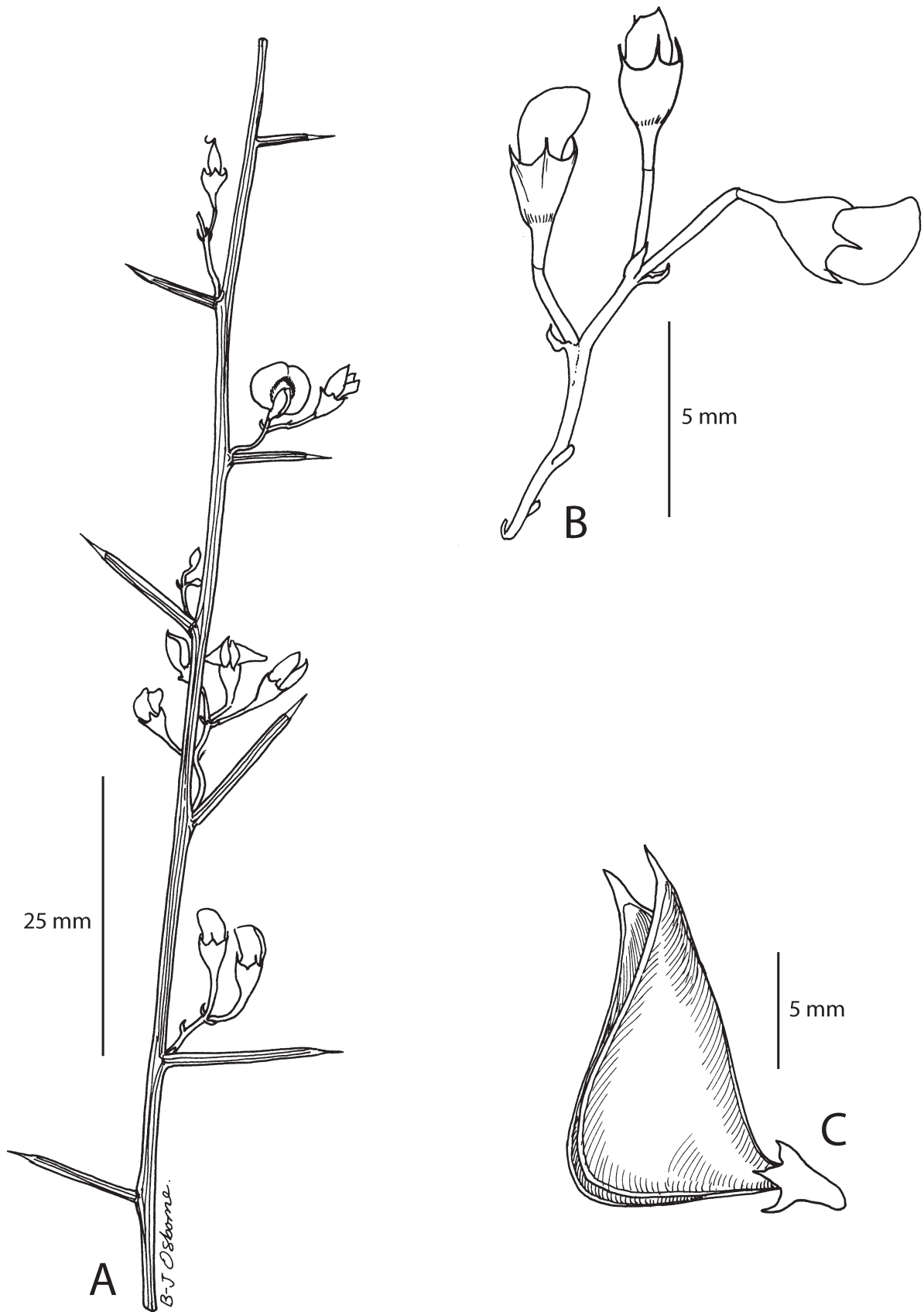
**WESTERN AUSTRALIA. Irwin:** Three Springs area, 29°40'S, 115°40'E, *C. Chapman* 8, 28 August 1972 (CBG, PERTH); *ibid.*, *C. Chapman* (37) B76, 10 August 1976 (CBG, MEL); *ibid.*, *M.D. Crisp* 6317, 2 October 1979 (CBG); *ibid.*, *C. Chapman* (72)77, 18 September 1977 (CBG, K); between Coorow & Arrino, 29°30'S, 116°E, *W.E. Blackall* 2606, September 1932 (PERTH).

**Affinity:**—*Daviesia bursarioides* is a very distinctive plant, diagnosed by the regular, divaricate branching pattern in combination with the spinescent branchlet apex and the small, narrowly obovate phyllodes. Vegetatively it resembles a *Bursaria* (Pittosporaceae) and cannot be confused with any other species in the genus. The elongated, partly umbelliform, partly racemiform inflorescences, as well as details of the flowers and fruits, suggest a relationship to *D. costata* and *D. longifolia*, though these species have striate linear phyllodes several cm long. The molecular phylogeny indicates that *D. bursarioides* is closest to *D. divaricata*, *D. localis* and *D. pleurophylla* (Fig. 1A), with which it shares a divaricating growth habit, spinescent branchlet tips, umbelliform inflorescences, reduced phyllodes and—with *D. localis* only—viscid pedicels and calyces. However, it is readily distinguished from all these by its obovate phyllode shape and much longer inflorescence. *Daviesia pedunculata* is similar in the inflorescence (especially the length), viscid pedicels and pruinose branchlets; however, the latter has larger (7–37 × 2–16 mm), pungent leaves and non-divaricate, non-spinescent branchlets.

**13. *Daviesia pleurophylla*** Crisp (1995: 1221). Type [approximate locality data given because the species is rare]: Western Australia, Cape Range, 22°20'S, 113°50'E, *A.S. George* 10288, 5 September 1970. Holotype: PERTH; isotypes: CBG, K, MEL

Large open *shrubs* to 3 m tall, often single- or few-stemmed at base, with an open divaricately branched crown, glabrous. *Root anatomy* normal (unistelar). *Branchlets* numerous, gently flexuose, terete, striate with multiple pale ribs, subspinescent; nodes pale yellowish. *Phyllodes* scattered, widely spreading, needle-like, acuminate, pungent, articulated at base, 5–25 mm long, ca. 0.75 mm diam., striate with multiple pale ribs. *Unit inflorescences* 1(2) per axil, racemose to umbellate, 2–4-flowered; *peduncle* 3–18 mm long; *rachis* from almost nil to 6 mm long; *subtending bracts* ascending, narrowly oblong, ca. 1 mm long. *Pedicels* 2–4 mm long. *Calyx* campanulate, 3–4 mm long including the ca. 1.5 mm, stipe-like receptacle which is nearly as long as the tube, with 10 ribs extending from teeth and sinuses to the pedicel; lobes uniform with teeth acuminate or reduced, ca. 0.5–0.75 mm long. *Corolla* yellow and dark red; *standard* transversely elliptic, emarginate, ca. 5.5 × 6 mm including the ca. 1.5 mm claw; *wings*





**FIGURE 15.** *Daviesia pleurophylla*. A. Flowering branchlet. B. Inflorescence in bud. C. Pod. A–C from *George 10288* (isotype). Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

obovate, rounded and strongly incurved at apex, auriculate, with a lobe opposite on the abaxial margin, ca.  $5 \times 2.25$  mm including the ca. 1.5 mm claw; *keel* half broadly elliptic, obtuse, saccate, ca.  $4 \times 1.5$  mm including the 1 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, strongly flattened filaments and longer, slender, basifixed, 2-celled anthers; filaments free. *Pods* obliquely shallowly obtriangular, acute, compressed, ca.  $13\text{--}14 \times 8$  mm long, straw-coloured; upper suture sigmoid; lower suture acute but broadly rounded. *Seed* ellipsoid, compressed, ca. 4.7 mm long, ca. 3 mm broad, ca. 0.8 mm thick; *aril* 0.8 mm long. (Fig. 15).

**Flowering period:**—One specimen flowering in September. *Fruiting period:* one specimen seen fruiting in September.

**Distribution:**—Known only from the Cape Range–Exmouth area, Western Australia.

**Habitat:**—Grows in open tall shrubland on deep red sand dunes, where it is locally dominant.

**Conservation status:**—National: Not listed. WA: Priority 2, possibly threatened or near-threatened but not yet adequately surveyed.

**Additional specimen examined:**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Carnarvon:** Near Exmouth,  $21^{\circ}50'S$ ,  $114^{\circ}10'E$ , *M.D. Crisp 9380 & L.G. Cook*, 12 October 2001 (CANB, PERTH).

**Affinity:**—This is one of the few species in the genus that are restricted to the tropics; moreover, it is a distinctive plant that cannot be confused readily with any other. It shares some features with the closely related *D. costata*, *D. longifolia* and *D. pauciflora*. For example, the inflorescence and ribbing on the branchlets are similar to those in all three species, and ribbed phyllodes are seen in *D. longifolia* and *D. pauciflora*. Additionally, *D. costata* has uniform calyx-teeth and very similar petals to those of *D. pleurophylla*, notably the standard, which is broader than long (a rare feature in the genus). However, *D. costata* immediately differs from *D. pleurophylla* in its flat, linear, longer phyllodes and the lack of an articulation at their base.

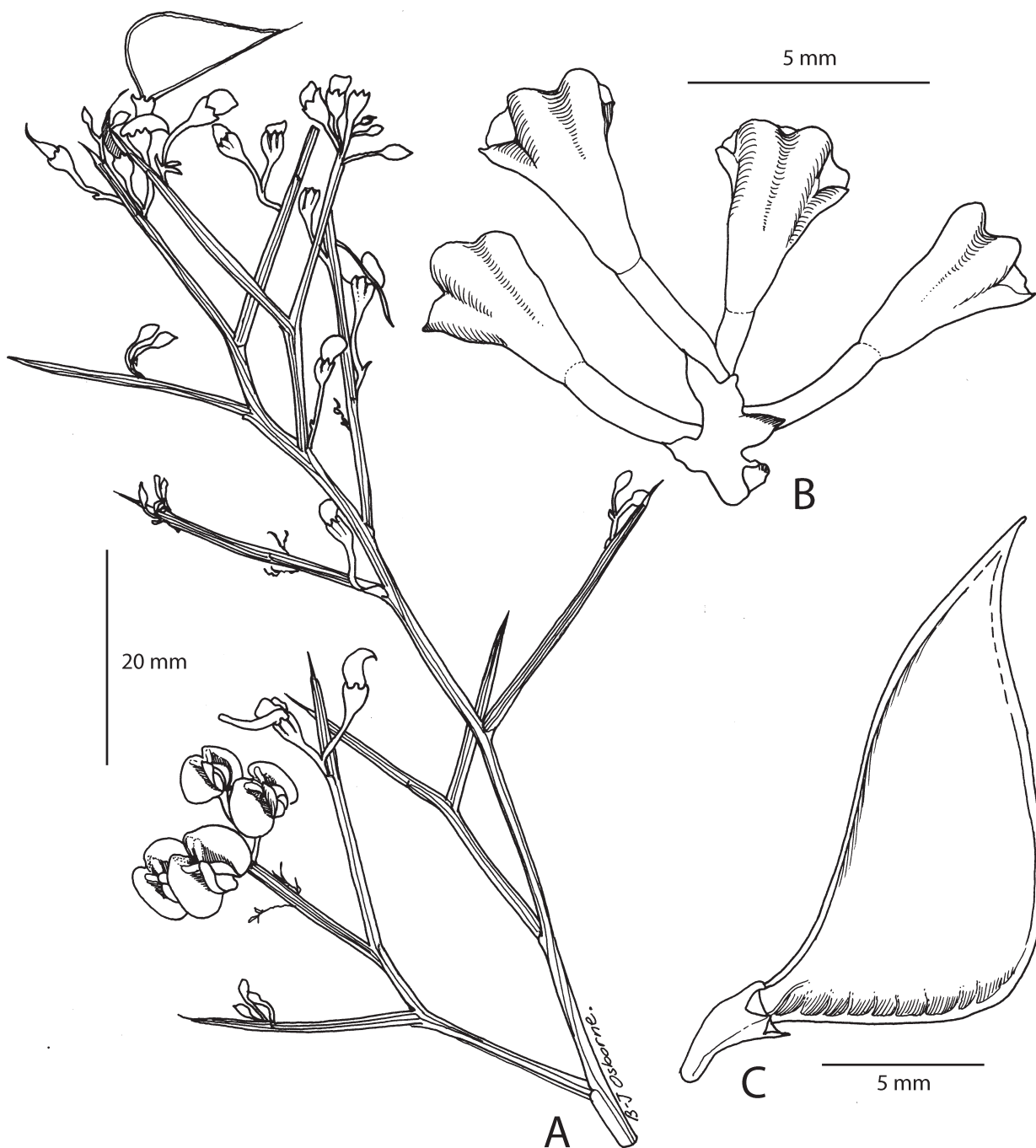
**14. *Daviesia divaricata*** Bentham (1837b: 31), Bentham (1837a: 75), Bentham (1864: 88), Crisp (1987a: 250), Crisp (1995: 1188), Wheeler *et al.* (2002: 747). Type: ‘King Georges Sound (*Huegel.*)’ Holotype: W

*Daviesia paniculata* Bentham (1837b: 31), Bentham (1837a: 75), Bentham (1864: 88). Type: ‘Swan-River. (*Huegel.*)’ Lectotype (Crisp 1995: 1188): Freemantle [sic], *Huegel 88* (W); isolectotype: K.

Low and spreading to bushy and erect, glaucous *shrubs*, 0.3–3 m high, glabrous except inside calyces (subsp. *lanulosa*). *Root anatomy* anomalous (cord type) in both subspecies, sometimes developing late. *Branchlets* terete, prominently ribbed, divaricate to ascending, spinescent. *Phyllodes* all reduced to triangular scales ca. 1 mm long, articulated at branchlet, keeled. *Unit inflorescences* 1 per axil, racemose or umbellate, 1–6-flowered; *peduncle* 1–3 mm long; *rachis* from almost nil to 3 mm long; *subtending bracts* oblong, appressed, ca. 1 mm long. *Pedicels* 2–4.5 mm long. *Calyx* 4–4.5 mm long including the 1.5–2 mm receptacle, with or without a ring of hairs around the lobes (very thick and woolly in subsp. *lanulosa*), with 5 ribs (prominent in subsp. *lanulosa*); upper 2 lobes united into a broad, truncate lip ca. 0.25 mm long (subsp. *divaricata*), or united higher than the lower 3 and ca. 0.75 mm long (subsp. *lanulosa*); lower 3 lobes broadly triangular, ca. 0.25–0.75 mm long. *Corolla: standard* strongly reflexed, depressed-ovate, deeply emarginate,  $6.5\text{--}8.5 \times 8\text{--}10$  mm including the 1–1.5 mm claw, with 2 raised calli at the base of the lamina, deep orange on the outer half, with a deep maroon inner half that has 2 yellow linear marks at  $45^{\circ}$  (forming a ‘V’); *wings* obovate with a rounded, incurved apex, strongly auriculate, saccate,  $5\text{--}7 \times 2\text{--}2.5$  mm including the 1.5–2 mm claw, deep maroon; *keel* half very broadly obovate with an acute apex, saccate,  $5\text{--}6 \times 1.5\text{--}2$  mm including the ca. 1.5 mm claw, deep maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and shorter, rounder, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pods* obliquely shallowly obtriangular, acute to acuminate,  $11\text{--}16 \times 5\text{--}8$  mm; upper suture sigmoid; lower suture acute but broadly rounded. *Seed* oblong, sometimes compressed horizontally, 4.2–4.6 mm long, 2.5–3 mm broad, 1.4–2 mm thick, light brown with some black mottling; *aril* 2.5–3 mm long, extending over the end of the seed. (Fig. 16).

**Flowering period:**—May to early November. *Fruiting period:* August to November.

**Distribution:**—Western Australia, sandplains and dunes, mainly near the coast, from the Hutt River Plains south to the Busselton area.



**FIGURE 16.** *Daviesia divaricata* subsp. *divaricata*. A. Branchlet in bud, flower and immature fruit. *Daviesia divaricata* subsp. *lanulosa*. B. Inflorescence with flowers represented by calyces only (woolly hairs are internal and not visible from this angle). C. Pod. A from M.E. Phillips WA/62-924; B, C from Crisp 6312. Drawn by B.-J. Osborne.

**Affinity:**—*Daviesia divaricata* is closely related to *D. localis*, with which it shares a distinctive pair of divergent yellow markings at the base of the standard, often basally joined to form a ‘V’ shape, as well as generally similar morphology in the growth habit, including spined-tipped striate to ribbed branchlets, and similarity of the reproductive parts. Molecular data also strongly support a sister group relationship between these two species (Fig. 1A). *Daviesia localis* is readily distinguished by the presence of terete, pungent phyllodes 2–8 mm long, and by the viscid inflorescences. *Daviesia divaricata* may be confused with leafless specimens of *D. horrida*, which differs in having an orange (not yellow) standard with a single (not two) vertical yellow mark in the dark red centre and spreading, truncate (not appressed, acute) bracts.

**14a. *Daviesia divaricata*** Benth. subsp. *divaricata*

*Calyx* campanulate, with or without a thin ring of hairs around the calyx lobes, with 5 faint ribs on the lobes; upper 2 lobes united into a broad, truncate lip, ca. 0.25–0.5 mm long; lower 3 lobes triangular, 0.25–0.5 mm long. *Corolla: standard* 6.5–8 × 8–10 mm including the 1–1.5 mm claw. (Fig. 16A).

**Flowering period:**—June to early November. *Fruiting period:* August to November.

**Distribution:**—Western Australia, near the coast from Geraldton south to Busselton area; extending inland (e.g. Three Springs) in the north.

**Habitat:**—Grows on sandy soils over clay, gravel or laterite or limestone, on flat sandplains or hills in heathland, mallee shrubland or eucalypt woodland.

**Selected specimens (116 examined):**—**WESTERN AUSTRALIA. Irwin:** 25 km W of Three Springs, 29°32'S, 115°33'E, *C. Chapman* (21)76, 31 July 1976 (CBG, K, PERTH); 13 km W of Arrino, 29°26'S, 115°30'E, *C. Chapman* (31)76, 31 July 1976 (CBG, MEL, PERTH); 6 km N of Three Springs, 29°30'S, 115°44'E, *C. Chapman* (21)78, 30 October 1978 (CBG, MEL, PERTH). **Avon:** 8 km W of Moora, 30°38'S, 116°05'E, *D.J.E. Whibley* 3141, 8 October 1969 (AD, PERTH). **Darling:** 12 km SE of Cliff Head, 35°11'S, 117°54'E, *S. Chambers* 143, 22 September 1966 (PERTH); Waroona, 32°51'S, 115°55'E, *G.F. Berthoud s.n.*, July 1907 (NSW 34806); 14.5 km N of Yanchep, 31°25'S, 115°37'E, *M.E. Phillips* WA/62-924, 22 September 1962 (CBG 9714).

**Affinity:**—Subsp. *divaricata* differs from subsp. *lanulosa* mainly in the calyx, which lacks a ring of prominent, woolly hairs inside the lobes. Also, the upper 2 lobes are united into a truncate lip and the calyx ribs are not as prominent.

**14b. *Daviesia divaricata*** Benth. subsp. *lanulosa* Crisp & G.Chandler, *subsp. nov.*

Differs from *D. divaricata* subsp. *divaricata* in having a prominent ring of woolly hairs around the inside of the calyx lobes, the upper two lobes are not united in a truncate lip and the calyx has five prominent ribs.

**Type:** WESTERN AUSTRALIA: Irwin: Hutt River Plains, 4 km NNW of Yerina Spring, 28°04'S, 114°19'E, *M.D. Crisp* 6312, *J. Taylor & R. Jackson*, 1 October 1979. Holotype: CBG; isotypes: CANB, PERTH.

*Calyx* tapering from the apex of the lobes to the base of the receptacle, prominently 5-ribbed; lobes ca. 0.75 mm long, with thick, woolly hairs inside; upper two lobes united higher than the lower three but not forming a truncate lip. *Corolla: standard* 8–8.5 × 9.5–10 mm including the ca. 1.5 mm claw. (Fig. 16B, C).

**Etymology:**—The subspecific epithet, from the Latin meaning woolly, refers to the ring of woolly hairs inside the calyx lobes.

**Flowering period:**—May to October. *Fruiting period:* July to October.

**Distribution:**—Western Australia, replacing subsp. *divaricata* in the north, from near Walkaway to the Murchison River.

**Habitat:**—White, grey or yellow, sometimes gravelly, sand, in *Banksia* and *Acacia* heathland.

**Selected specimens (23 examined):**—**WESTERN AUSTRALIA. Irwin:** 46 km NW of Strawberry on Burma Road, 28°58'S, 115°00'E, *M.G. Corrick* 8275, 28 September 1982 (CANB, MEL); 17.5 km W of Walkaway, 28°56'S, 114°48'E, *J.S. Beard* 6922, 25 October 1973 (PERTH); Moresby Range, Howatharra Hill Reserve, 33.5 km N of Geraldton, 28°12'S, 114°39'E, *D. & N. McFarland* 1147, 21 August 1974 (PERTH); 48 km E of Geraldton, 28°43'S, 115°00'E, *J. Long* 47, 19 September 1960 (PERTH); 23 km N of Geraldton along highway to Carnarvon, 28°36'S, 114°38'E, *M.D. Crisp* 9377 & *L.G. Cook*, 12 October 2001 (CANB, MEL, NSW, PERTH).

**Affinity:**—See diagnosis above.

**15. *Daviesia localis*** Hislop (2015: 27–30). **Type:** WESTERN AUSTRALIA: Darling [approximate locality data given because the species is rare]: north of Bindoon, 31°10'S, 116°20'E, *F. Hort* 1904, 6 November 2002. Holotype: PERTH 6230687; isotypes: CANB, MEL

Erect, spreading *shrubs*, 1.5–3 m high and to ca. 3 m wide, single-stemmed at ground level, apparently killed by fire, glabrous. *Root anatomy* unknown. *Branchlets* divaricate, straight, terete, striate, glabrous, minutely papillose to ± smooth; apex spinescent. *Phyllodes* scattered, shallowly antrorse to almost divaricate (45–80°), gently recurved,



FIGURE 17. *Daviesia localis*. Holotype. Photograph provided by the Curator of PERTH.

terete, striate, apically acuminate and pungent, inarticulate at base, 2–8 × 0.7–1.2 mm; *stipules* caducous, filiform, 0.2–0.3 mm long. *Unit inflorescence* 1 per axil, umbelliform, 4–7-flowered; *peduncle* 5–9 mm long, viscid; *subtending bracts* appressed, oblong to narrowly elliptic, with ± scarious margins, 0.7–1.1 mm long, not striate, strongly concave adaxially. *Pedicels* 1.5–7.0 mm long, viscid; apex expanded, annular and wider than receptacle at articulation. *Calyx* 3.8–5.2 mm long, including the 1–2.5 mm long receptacle, lightly ribbed; upper 2 lobes united in a shallowly emarginate lip; lower 3 lobes very broad and short, < 0.3 mm long; lobe apices with short, vesicular hairs, mostly inside. *Corolla: standard* depressed-ovate with a deeply emarginate apex, 8.5–9.5 × 8.5–10 including the 2.0–2.3 mm claw, orange-yellow in distal half, red centrally with a conspicuous yellow, V-shaped mark; *wings* obovate with a rounded incurved overlapping apex, strongly auriculate at the base, 6.0–6.7 × 3.0–3.5 mm including the 2.0–2.5 mm claw, dull red; *keel* incurved with an obtuse apex, saccate, 5.5–6.0 × 2.8–3.2 mm, dull red. *Stamens* strongly dimorphic: inner whorl of 5 with filaments ± terete in the upper half (excluding the vexillary stamen), and anthers subdorsifixed with confluent thecae, ca. 0.3 mm long; outer whorl of 5 with filaments flattened throughout and with 2-celled, basifixed anthers, ca. 0.5 mm long; vexillary stamen with filament channelled adaxially in the upper half; filaments free. *Pod* obliquely obtriangular, compressed, acute, 15–18 × 6–8 mm, pale to dark brown at maturity, obscurely reticulate; upper suture gently sigmoid; lower suture strongly convex. *Seed* 6–7 mm long, 3.2–3.5 mm wide, copper-brown; aril well-developed, cream-coloured, 4.0–4.5 mm long. (Fig. 17).

**Flowering period:**—Mainly between early October and the middle of November. *Fruiting period:* Mature fruit has been collected during the last week of November.

**Distribution:**—Currently known only from one population north of Bindoon, ca. 100 km NE of Perth.

**Habitat:**—The population occurs on a low ridge, in orange-brown sandy soil in the understorey of forest of *Eucalyptus marginata* Donn ex Smith (1802: 302) and *Corymbia calophylla* (Lindley 1841: 72) K.D. Hill & Johnson (1995: 240) with a heathy understorey.

**Conservation status:**—National: Not listed. WA: Priority 1, possibly threatened or near-threatened but not yet adequately surveyed.

**Specimens examined:**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Darling:** North of Bindoon, 31°S, 116°E, *M. Hislop* 2352, 28 October 2001 (CANB, PERTH); *ibid.*, *M. Hislop & F. Hort* MH 2481, 25 November 2001 (CANB, PERTH); *ibid.* *F. & J. Hort* 3903, 30 October 2014 (MEL, PERTH).

**Affinity:**—Closely related to *D. divaricata* (Fig. 1A), with which it shares the morphological synapomorphy of a distinctive pair of divergent yellow markings at the base of the standard, often basally joined to form a ‘V’ shape. Additionally, it has generally similar morphology in the growth habit, including spined-tipped striate branchlets, and similarity of the reproductive parts. *Daviesia divaricata* is readily distinguished by reduction of the leaves to appressed scales and by its non-viscid inflorescences.

## VI. Lipped Calyx Clade

### VI.a. *D. cordata-longifolia* Clade

**16. *Daviesia longifolia*** Benth. in Lindley (1839: 14), Bentham (1864: 78), Crisp (1987a: 251), Crisp (1991a: 255), Crisp (1995: 1208), Wheeler *et al.* (2002: 744). Type: Swan River, *Drummond 1st collection*, 1839. Holotype: K; isotype: CGE

*Daviesia chordophylla* Meisner (1844: 48), Bentham (1864: 78). Type: ‘Swan River [*Drummond*] No. 239, ex parte, et 240’.

Lectotype (Crisp 1991a): *Drummond 240*, ex Herb. Shuttleworth (BM); isolectotype: CGE, G (3 sheets), K (2 sheets), MEL 77812, OXF, P (2 sheets), W (2 sheets). Syntype: *Drummond 234 (239?)*, partly, ex Herb. Shuttleworth (BM); isosyntype: ex Herb. Meisn. (NY).

Bushy, multi-stemmed *shrubs*, 0.3–0.7 (1.5) high, 1–3 m broad, glabrous. *Root anatomy* normal (unistelar). *Branchlets* weak, often tangled, compressed or terete, angular with prominent ribs. *Phyllodes* scattered, ascending, linear, flat to terete, sinuous or gently curved, apically acute or obtuse, mucronate, basally inarticulate, decurrent, to 250 × 1–10 mm, with 6–many parallel ribs, greyish green, often reduced in size toward branchlet apex. *Unit inflorescences* 1 or more per axil, racemose, 4–15-flowered (or fewer by early bud fall), usually with 2(–4) flowers grouped at the apex; peduncle (4–)10–17 mm long; rachis (0–)6–28(–150) mm long; *subtending bracts* mostly

appressed, triangular or ovate, keeled, often with a small lobe on each margin, minutely fimbriate, ca. 1 mm long. *Calyx* 3–4 mm long including the ca. 1 mm receptacle to which it is contracted, ventricose above, smooth or with 5 (10) obscure ribs; upper 2 lobes recurved, united into a truncate, retuse lip; lower 3 lobes shorter than upper 2, very depressed-triangular, apiculate, ca. 0.5 mm long, apex tinged purple. *Corolla*: standard depressed-ovate to very broadly ovate, emarginate, truncate at base, 6.5–9 × 6.5–8.5 mm including the 2–3.5 mm claw, yellow infused with dark red towards the centre, with an intense yellow oblong mark at centre; *wings* obovate, rounded and incurved at apex, auriculate, 6.5–8 × 2–2.5 mm including the 2–3 mm claw, dark red; *keel* half very broadly obovate, ± acute, scarcely auriculate, saccate, 4.5–6 × 1.5–2 mm including the 1.5–2.5 mm claw, deep red at tip. *Stamens* strongly dimorphic: inner whorl of 5 with slightly compressed filaments and versatile, very broadly ovoid anthers with confluent thecae; outer whorl of 5 with strongly compressed filaments and basifixed, transversely broadly obloid, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, compressed, 7–12 × 4–7 mm, with slightly raised, reticulate venation, grey-brown; upper suture sigmoid; lower suture acute. *Seed* obovoid to ovoid, ca. 3.5 mm long, ca. 2 mm broad, ca. 1 mm thick, pale greenish brown with a little mottling; *aril* ovoid, swollen towards base, 0.75–1.5 mm long, pale yellow. (Fig. 18).

**Flowering period:**—August in the north to December in the south. *Fruiting period:* October in the north to November further south.

**Distribution:**—Western Australia, from Eneabba south to the Blackwood and Gordon Rivers, and east to Yealering, Tarin Rock and Katanning in the southern wheatbelt.

**Habitat:**—Grows in sand or gravelly clay soil derived from laterite. Associated vegetation is most commonly heath dominated e.g. by *Grevillea* R. Brown ex Knight (1809: xvii), *Banksia* or *Allocasuarina*. Also in open forest dominated by *Eucalyptus marginata* and *Corymbia calophylla* or in woodland with *E. wandoo* Blakely (1934: 112).

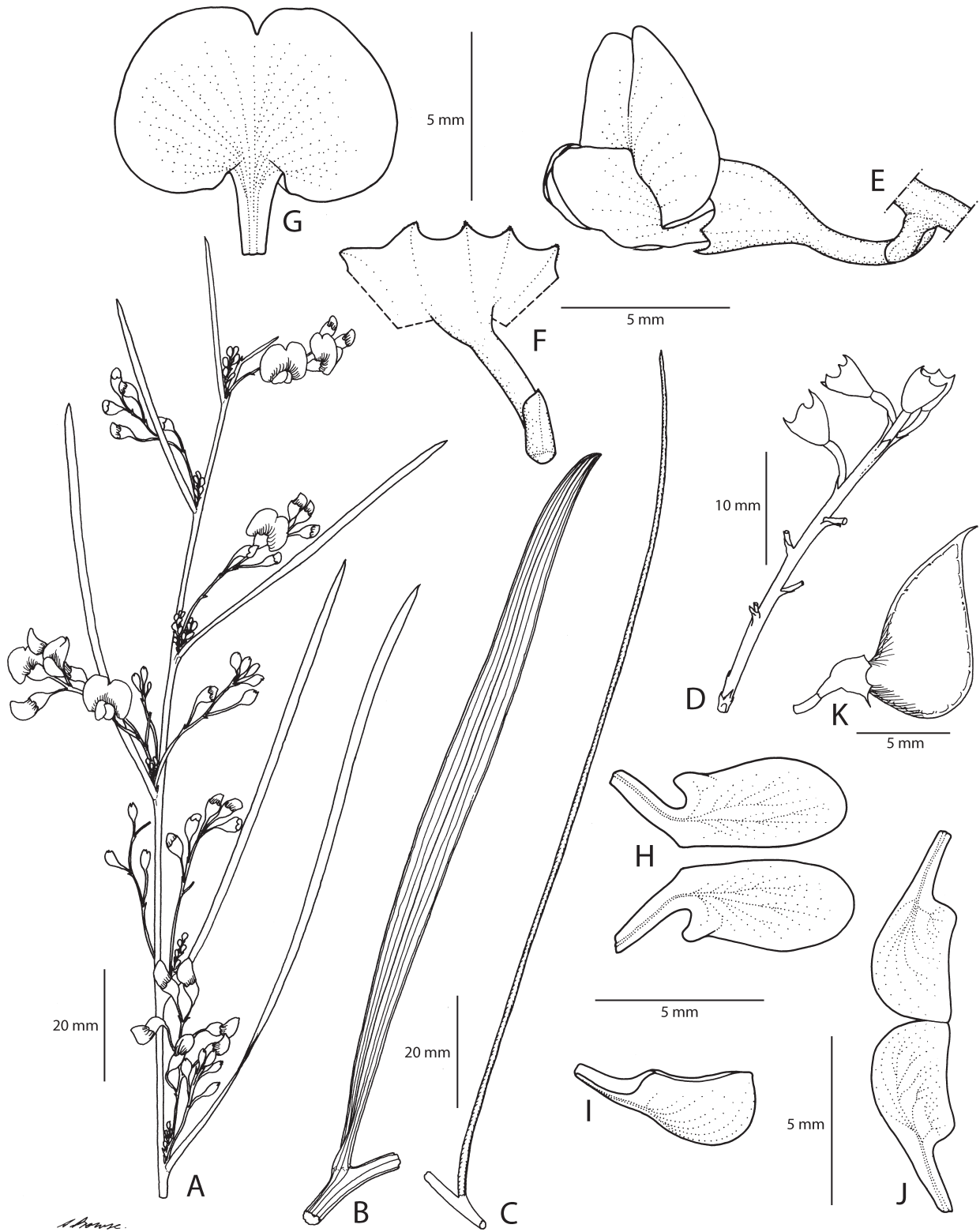
**Selected specimens (53 examined):**—**WESTERN AUSTRALIA.** **Irwin:** 42 km W of Winchester, 29°48'S, 115°30'E, *C. Chapman* (113)77, 23 October 1977 (CBG, PERTH); 20 km S of Eneabba, 29°58'S, 115°13'E, *C. Chapman* (114)77, 23 October 1977 (CBG, MEL, PERTH); Green Head Road, 30°04'S, 115°19'E, *M.D. Crisp* 6222 *et al.*, 29 September 1979 (CBG, PERTH). **Avon:** 3 km SSW of Wedin, 33°00'S, 117°41'E, *M.D. Crisp* 6148 *et al.*, 26 September 1979 (CBG, PERTH). **Darling:** 93 km NNE of Perth along Northern Highway, 31°15'S, 116°10'E, *C. Chapman* (122)77, 21 November 1977 (CBG, PERTH); Mt Lesueur, 30°10'S, 115°12'E, *R.D. Royce* 7727, 4 November 1962 (PERTH); Blackwood River, *J. Forrest s.n.* (MEL 81161–4); 80.8 km SE of Perth, 32°17'S, 116°34'E, *A.S. George* 7369, 25 November 1965 (AD, CANB, NSW, PERTH); Harvey, 33°05'S, 115°54'E, *Miss Lambert* 112, December 1900 (PERTH); Kalamunda, Darling Range, 31°58'S, 116°03'E, *A. Morrison s.n.*, 18 December 1901 (CANB 336586, E, PERTH 2729806); Preston River, 33°32'S, 116°02'E, *F. Mueller s.n.*, 8 December 1877 (MEL 81300); Gordon River, 34°14'S, 117°14'E, *A.F. Oldfield* 499 (MEL); Sussex, 33°53'S, 115°44'E, *L. Preiss* 1184, 23 December 1839 (MEL, S); Muchea, 31°35'S, 115°58'E, *R.D. Royce* 4718, 2 December 1953 (PERTH).

**Affinity:**—*Daviesia longifolia* is very similar to both *D. costata* and *D. pauciflora*. *Daviesia costata* has ten prominent ribs on the calyx and the lobes are uniform, whereas in *D. longifolia* the calyx is either ribless or has five obscure ribs and the upper two lobes are outcurved and larger than the lower three. In *D. pauciflora* the calyx lobes are all alike and not outcurved. The profile of the calyx of *D. longifolia* also differs from that of *D. pauciflora* in being ventricose on the upper (adaxial) side.

Another character distinguishing these two species is the size of the inflorescence. In *D. pauciflora*, the racemes are usually shorter (rachis usually 0–4 mm long, peduncle usually 1–13 mm long) and bear fewer flowers (usually 1–4). In addition, *D. longifolia* differs in having irregularly curved or sinuous phyllodes, a truncate base to the standard, parallel wings that often overlap at the apex and smaller pods (11–14 mm long in *D. pauciflora*).

**Variation:**—This is a variable species, mainly in the width and cross-section of the phyllodes. The variation shows a certain amount of geographic pattern but is not sufficiently strong to justify the recognition of infra-specific taxa.

Plants occurring in the Mt Lesueur to Eneabba region tend to have broader phyllodes (e.g. *Chapman* (113)77 and *Royce* 7727). These range in width from 2.5–10 mm but are usually > 4 mm wide. Farther south the phyllodes are generally less than 4 mm broad, although in specimens from Blackwood River, at the southern limit of the species' range (*Forrest s.n.*, MEL), they are up to 6 mm broad.



**FIGURE 18.** *Daviesia longifolia*. A. Flowering branchlet. B. Broad phyllode. C. Terete phyllode. D. Inflorescence (flowers represented by calyxes only). E. Flower with bract. F. Calyx opened out, upper lobes at left. G. Standard. H. Wings. I. Keel. J. Same, opened out. K. Pod. A from *Morrison s.n.* (CANB 336586); B, D–J from *Crisp 6222*; C from *Crisp 6148*; K from *Chapman (114)77*. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.



Towards the central and eastern portion of the range, i.e. in the vicinity of Boddington, Yealering and Harrismith, the phyllodes become terete (e.g. *Crisp 6148*). This is the form represented by the synonym *D. chordophylla*. A number of specimens from the Perth–Pinjarra region (e.g. *George 7369* and *Mueller s.n.*, MEL) show a continuous transition from this terete-leaved form to the typical form with compressed phyllodes.

Typically, *D. longifolia* has eight or more ribs per phyllode. However, some southern specimens have phyllodes with an oblong cross-section and three parallel ribs visible on each face (e.g. *Preiss 1184* and *Forrest s.n.*, MEL). Closer inspection of these specimens reveals that there are two ribs at each margin, i.e. one at each angle of the oblong cross-section. With the midribs on the upper and lower surface, this makes a total of six ribs per phyllode. These phyllodes may be confused with those of *D. costata*, in which three ribs are visible on both the adaxial and abaxial faces. In fact, the phyllodes of *D. costata* have a total of only four ribs because there is a single rib at each margin. The phyllodes of *D. costata* are flat when broad and tetragonous in section when narrow. See the ‘Affinity’ section above for additional differences between *D. longifolia* and *D. costata*.

**17. *Daviesia pauciflora*** Crisp (1991a: 257), Crisp (1995: 1220). Type [approximate locality data given because the species is rare]: Western Australia, near Esperance, *A.E. Orchard 1561*, 16 October 1968. Holotype: AD; isotypes: CANB, MEL, PERTH

Diffuse, multi-stemmed *shrubs*, 0.3–0.8 m tall, glabrous. *Root anatomy* unknown. *Branchlets* ascending, ribbed, initially compressed horizontally, becoming terete. *Phyllodes* sparsely scattered, ascending to erect, continuous with and resembling branchlets, linear, straight, compressed, apically obtuse, mucronate, tapering to base, to 400 × 1–1.5 mm, with 3 primary and 0–2 secondary parallel ribs along each face, green. *Unit inflorescences* sparse on plant, 1(2) per axil, racemose or occasionally shortly paniculate by reduction of the uppermost 2 or 3 phyllodes to bracts, 1–3(–4)-flowered, mostly with a pair of flowers at the apex of the rachis; *peduncle* 1–13 mm long; *rachis* from almost nil to 5 mm long; *subtending bracts* appressed, ovate, 1–1.5 mm long, keeled. *Pedicels* 1.5–10 mm long. *Calyx* somewhat flared at top, 4–5 mm long including the 1–2 mm stipe-like receptacle to which it is contracted; ribs obscure; lobes very shallowly triangular, apiculate, ca. 1 mm long, upper 2 united slightly higher than lower 3, apex of lobes tinged purple-brown. *Corolla: standard* transversely broadly elliptic, strongly emarginate, cordate, ca. 8 × 10 mm including the 2 mm claw, mostly yellow with red towards the centre and an intense yellow oblong marking at the centre; *wings* obovate, constricted in the middle, very obtuse and incurved at the apex, strongly auriculate, ca. 6 × 3 mm including the ca. 2 mm claw, dark red with orange margins at tips; *keel* half very broadly obovate, subobtuse, auriculate, saccate, ca. 5 × 2 mm including the ca. 2 mm claw, dull brownish. *Stamens* strongly dimorphic: inner whorl of 5 with subterete filaments and versatile, ovoid anthers with confluent thecae; outer whorl of 5 with compressed filaments and basifixed, obloid, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, strongly compressed, 11–14 × 5.5–6 mm, faintly reticulate, greenish brown; sutures slightly thickened, upper suture sigmoid; lower suture acute. *Seed* ellipsoid, ca. 4.25 long, ca. 2.5 broad, ca. 1.5 mm thick, pale yellow mottled with black; *aril* ovate in outline, crenulate, ca. 2 mm long. (Fig. 19).

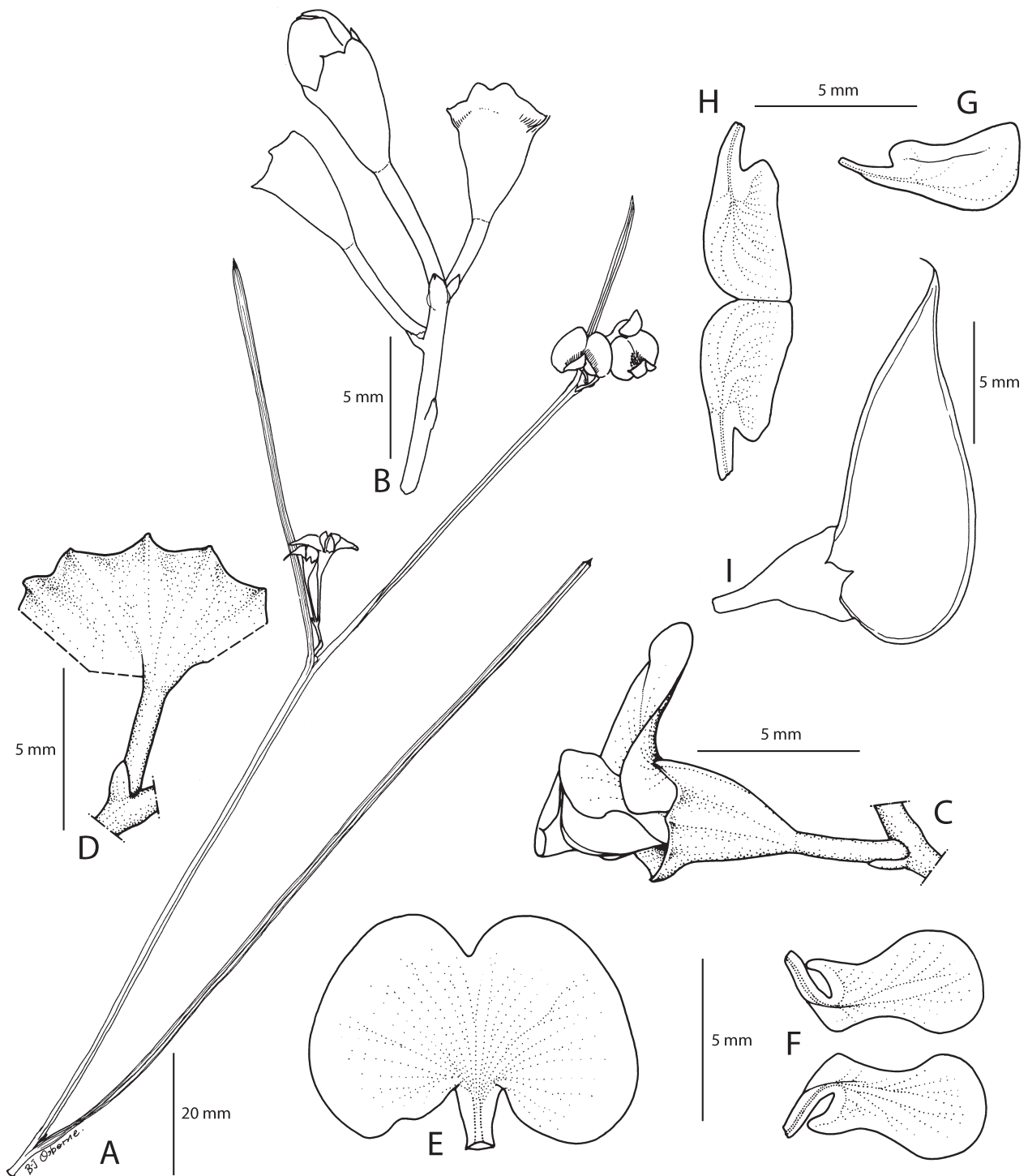
**Flowering period:**—October to January. **Fruiting period:** January.

**Distribution:**—Along the south coast of Western Australia from the Munghlinup area to east of Esperance and inland for a short distance.

**Habitat:**—Grows in white or grey sand over hard laterite or limestone in tall dense heath dominated by *Banksia speciosa* Brown (1810b: 210) or *Lambertia inermis* Brown (1810b: 188), with *Adenanthos* Labillardière (1805: t. 36), *Allocasuarina* and species of *Melaleuca* Linnaeus (1767: 509).

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (25 examined):**—Approximate locality data are given because the species is rare. **WESTERN AUSTRALIA. Roe:** Ca. 100 km ENE of Ravensthorpe, 33°30’S, 121°10’E, *M.A. Burgman 4525*, 9 October 1984 (CANB, PERTH). **Eyre:** W of Esperance towards Ravensthorpe, 33°40’S, 121°20’E, *M.D. Crisp 4925*, 8 January 1979 (AD, CBG, MEL, NSW, PERTH); *ibid.*, *M.D. Crisp 4926*, 8 January 1979 (CBG, K, PERTH); *ibid.*, *M.D. Crisp 4927*, 8 January 1979 (CBG, PERTH); W of Esperance towards Ravensthorpe, 33°40’S, 121°E, *M.D. Crisp 4934*, 8 January 1979 (CBG, PERTH); E of Shoal Cape, 33°50’S, 121°10’E, *G. Maxwell s.n.* (MEL 79036–7, NSW 34714, PERTH); E of Esperance, 33°50’S, 122°20’E, *R.D. Royce 8251*, 24 November 1964 (PERTH).



**FIGURE 19.** *Daviesia pauciflora*. A. Flowering branchlet. B. Inflorescence. C. Flower with subtending bract. D. Calyx opened out, upper lobes at left. E. Standard. F. Wings. G. Keel. H. Same, opened out. I. Pod. A, I from *Crisp 4926*; B–H from *Crisp 4925*. Drawn by B–J. Osborne and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Affinity:**—*Daviesia pauciflora* is very similar to both *D. longifolia* and *D. costata*, which are themselves closely similar. All three species have a low, multi-stemmed habit, linear, decurrent, ribbed phyllodes, racemose inflorescences with 2 or more flowers forming partial umbels at the apex of the rachis and closely comparable bracts, flowers and fruits.

The shape of the calyx serves to distinguish *D. longifolia* from *D. pauciflora*. In *D. longifolia*, the upper 2 lobes differ from the lower 3 in being larger and recurved at the tips, whereas in *D. pauciflora* the calyx lobes are

all alike and not recurved. The profile of the calyx of *D. longifolia* differs from that of *D. pauciflora* in being ventricose on the upper side. Another character distinguishing these two species is the size of the inflorescence. In *D. longifolia*, the racemes are usually longer (rachis usually 6–28 mm long, peduncle usually 10–17 mm long) and bear more flowers (usually 4–11). When the racemes of *D. longifolia* appear to have fewer than 4 flowers, it is usually because buds have fallen at an earlier stage of development. In addition, *D. longifolia* differs in having irregularly curved or sinuous phyllodes, a truncate base to the standard, parallel wings that often overlap at the apices and smaller pods (7–12 mm long).

*Daviesia costata* is distinguished from *D. pauciflora* by its prominently 10-ribbed calyx, the depressed-ovate standard that appears bilobed, wings that are not constricted in the middle and the vestigial auricles on the keel.

**18. *Daviesia costata*** Cheel (1920: 35), Crisp (1987a: 248), Crisp (1991a: 252), Crisp (1995: 1183), Wheeler *et al.* (2002: 743). Type: ‘This new plant was first collected at Queenswood [sic], on the Preston Valley Railway, by Mr. Max Koch in October, 1910; and bears the no. 2041. It has since been collected on sandy places in open jarrah forests, six miles from Donnybrook, in October, 1912, by the same collector. 6 miles from Donnybrook, *M. Koch*, October 1912’ (NSW 34717). Lectotype (Crisp 1991a: 252): Queenwood, *M. Koch*, October 1910 (NSW 34958, partly); isolectotype: BM, BRI, CANB, G (2 sheets), K (2 sheets), MEL 77996–8, MO, NSW 34718–9 & 34958 (partly), US

Straggling, sometimes bushy, multi-stemmed *shrubs*, to 0.7 m high and 1.3 m broad, glabrous. *Root anatomy* normal (unistelar). *Branchlets* rather lax, angular, ribbed. *Phyllodes* scattered, ascending, linear, rarely appearing terete (*Blackall 3266*, *Taylor 2231*), acute to rounded at apex, mucronate, tapered to the inarticulate decurrent base, 1–300 × 0.5–10 mm, pale grey-green, much reduced in size and often recurved, sometimes to scales, toward the apex of flowering branchlets; midrib prominent with 2 thickened marginal nerves and oblique lateral venation in phyllodes broader than 2.5 mm; phyllodes tetragonous but appearing terete when < 2.5 mm wide. *Unit inflorescences* 1 or more in upper axils, condensed racemes (or appearing paniculate by reduction of phyllodes to scales), (1–)3–8(–14)-flowered, with (0–)2–6 flowers forming a partial umbel at apex of rachis; *peduncle* 7–30(–60) mm long; *rachis* from almost nil to 100 mm long; *subtending bracts* somewhat spreading, ovate to obovate, keeled, ca. 1.5 mm long, viscid. *Pedicels* 3–11 mm long, usually hooked at apex. *Calyx* 3.5–5 mm long including the 1–2 mm stipe-like receptacle to which it is contracted, thick in texture, with 10 prominent ribs extending up from the base, 5 ending at the tips of the lobes and 5 not quite reaching the sinuses, the latter 5 sometimes forked at the upper ends, ribs and apices of the lobes tinged purple; all 5 lobes equal, transversely broadly triangular, ca. 0.5 mm long. *Corolla: standard* depressed-ovate, deeply emarginate and almost bilobed, cordate, with a small auricle on either side and 2 raised calli at the base of the lamina, ca. 6 × 10 mm including the ca. 1 mm claw, yellow with a dark red infusion towards the centre and an intensely yellow cuneate central marking; *wings* obovate with a rounded apex, incurved but hardly overlapping, auriculate, ca. 5 × 2.5 mm including the ca. 1 mm claw, dark red; *keel* half very broadly ovate with an acute apex, saccate, scarcely auriculate, ca. 5 × 2 mm including the ca. 1.5 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with filaments slightly to very compressed and globose, anthers subversatile with confluent thecae; outer whorl of 5 with very compressed filaments and basifixed, ovoid, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, compressed, acute, with somewhat thickened sutures, 10–15 × 5–7 mm, rather thin-walled; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 20).

**Flowering period:**—Mainly September and October, but also from July to February. *Fruiting period:* Apparently in summer. Seed set appears to be poor.

**Distribution:**—Western Australia, throughout the Darling Range from the Toodyay–Bindoon area south to the vicinity of the Blackwood and Gordon Rivers; also extending to the wheatbelt east of Perth towards Quairading and Corrigin and south to near Katanning.

**Habitat:**—Occurring on flat or sloping sites, in sand, or more usually, gravelly clay-loam derived from laterite. Associated vegetation is usually open forest dominated by *Eucalyptus marginata* and *Corymbia calophylla*, also woodland dominated by *E. wandoo* or *E. accedens* Fitzgerald (1904: 21), or tall heath with *Grevillea* and other large shrubs.



**FIGURE 20.** *Daviesia costata*. A. Flowering branchlet. B. Long phyllode. C. Inflorescence. D. Flower with bracts. E. Calyx opened out, upper lobes at left. F. Standard. G. Wings. H. Keel. I. Same, opened out. J. Pod. A from Morrison s.n. (PERTH 2778742); B from Dodd 6; C from Crisp 5366; D–I from Taylor 2135; J from Koch s.n. (type: NSW 34718). Drawn by B–J. Osborne and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Selected specimens (24 examined):—WESTERN AUSTRALIA. Darling:** 10 km from Donnybrook towards Mumballup, 0.8 km E of Queenwood, 33°33'S, 115°55'E, *M.D. Crisp 5366*, 21 January 1979 (AD, CBG, K, MEL, MO, PERTH); 1 km SE of North Bannister, 32°35'S, 116°28'E, *J. Taylor 2135 & P. Ollerenshaw*, 22 September 1983 (AD, CBG, MEL, PERTH); Logue Brook Dam beyond Saddle Dam, 32°59'S, 115°59'E, *T.A.*

*Halliday 211*, 5 December 1974 (AK, CANB, PERTH); *W.E. Blackall 3266* (PERTH); Collie, 33°22'S, 116°09'E, *L.W.J. Dodd 6*, February 1968 (PERTH); 6.4–8 km SE of Waroona, 32°51'S, 115°55'E, *A.S. George 6860*, 15 October 1965 (AD, CANB, PERTH); Mt Saddleback, 32°58'S, 116°27'E, *A. Morrison s.n.*, 15 November 1904 (PERTH 2778742); Plains south of the Blackwood River, 34°09'S, 115°15'E, *R.D. Royce 2950*, 24 October 1948 (PERTH). **Avon:** 27 km from Quairading towards Corrigin, 32°06'S, 117°34'E, *J. Taylor 2231* & *P. Ollerenshaw*, 25 September 1983 (CBG, MEL, PERTH).

**Affinity:**—*Daviesia costata* is very similar to *D. longifolia*, *D. pauciflora* and *D. implexa*. It can be most readily distinguished from all these species by the ten prominent ribs on the calyx, after which it was named (Cheel 1920). *Daviesia implexa* differs in having a larger calyx (5.5–7 mm long, including receptacle) without conspicuous ribs, and the upper two lobes are united into a truncate, emarginate lip. The calyx of *D. pauciflora* has obscure ribs at best, while that of *D. longifolia* has five (rarely ten) rather obscure ribs at best and also differs in the upper two lobes, which are recurved and larger than the lower three. Additional differences between *D. costata* and *D. pauciflora* are given under the latter. *Daviesia longifolia* and *D. costata* are superficially very alike and can be difficult to distinguish, especially when the phyllodes are narrow. Specimens with broader phyllodes (> 2.5 mm broad) differ in the venation. In *D. longifolia*, such phyllodes have two or more secondary longitudinal ribs along each face in addition to the midrib and marginal ribs. In *D. costata*, phyllodes when broad have raised venation but it runs obliquely to the margins. Even when the phyllodes are less than 2.5 mm broad, it is still possible to distinguish them. Those of *D. costata* become tetragonous in section with one rib at each angle and no other visible venation, whereas those of *D. longifolia* become rounded to terete (rarely oblong) in section and have six or more parallel ribs. Specimens of *D. costata* with extremely narrow phyllodes (0.5–1 mm broad) that appear terete but which are actually tetragonous are apparently localised near Quairading (*Blackall 3266*, *Taylor 2231*). An additional character of *D. longifolia* that distinguishes it from *D. costata* is the truncate base of the standard.

#### 19. *Daviesia implexa* (Crisp) Crisp, *comb. & stat. nov.*

Basionym: *Daviesia elongata* Benth (1864: 74) subsp. *implexa* Crisp (1995: 1191). Type [approximate locality data given because the species is rare]: Western Australia, Roe, E of Lake Grace, 33°10'S, 118°30'E, *J. Taylor 2264* & *P. Ollerenshaw*, 25 September 1983. Holotype: CBG; isotypes: K, MEL, PERTH.

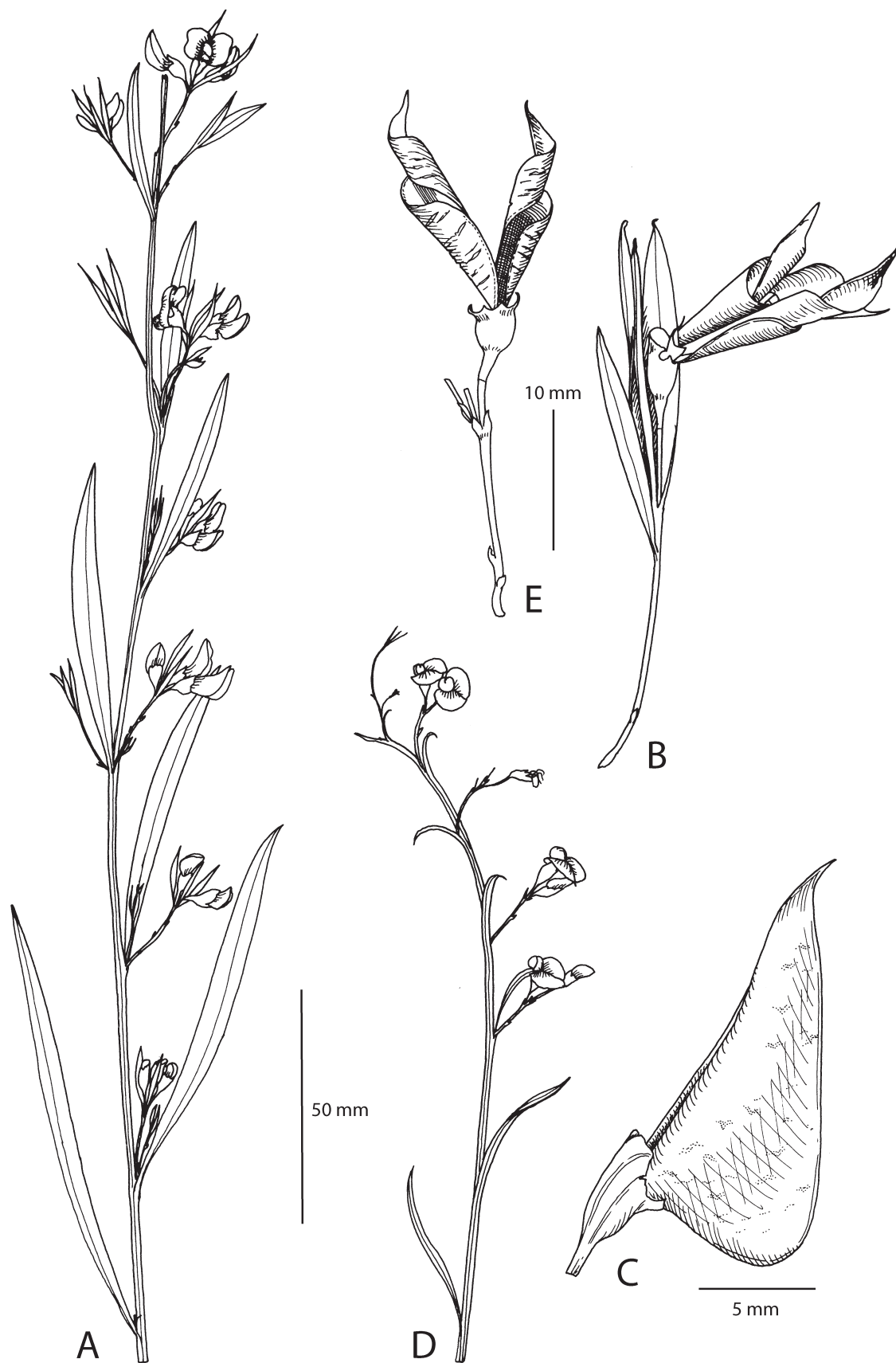
Hummocky shrubs to 1 m high and 2 m wide, multi-stemmed, tangled and straggling, glabrous, pruinose. *Branchlets* angular with prominent ridges or narrow wings. *Root anatomy* with anomalous secondary thickening (cord type). *Phyllodes* scattered, ascending, linear, twisted into a loose spiral (1–3 turns), recurved to hooked at the apex, basally inarticulate and decurrent, 5–100 × 2–5 mm, with a prominent midrib and thickened, waxy margins. *Unit inflorescences* racemose, 2- or 3-flowered; *subtending bracts* appressed, subulate, 1.5–2 mm long. *Pedicels* 2.5–6 mm long. *Calyx* slightly ribbed; upper 2 lobes united into a truncate, notched lip; lower lobes acute. *Corolla: standard* transversely elliptic, emarginate, 10–11.5 × 8–12 mm including the 3–4 mm claw, yellow or apricot with a narrow red-brown arc surrounding the yellow-green central circle, and a vertical yellow stripe at the centre of the abaxial surface; *wings* obovate, rounded and incurved at apex, enclosing the much shorter keel, auriculate, 8.5–11 × 3–4.5 mm including the ca. 3 mm claw, red with orange margins; *keel* half transversely very broadly obovate, acute, saccate, ca. 6.5 × 2–3 mm including the 2.5–3 mm claw, yellow. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly obtriangular, compressed, acuminate, 15–17 mm long including a long-acuminate beak, 7–8 mm broad; upper suture slightly sigmoid; lower suture acute. *Seed* ellipsoid, ca. 4 mm long, 2.5 mm broad, 1.5 mm thick, light brown; *aril* ca. 2.5 mm long. (Fig. 21D, E).

**Flowering period:**—September to January. *Fruiting period:* December and January.

**Distribution:**—Western Australia, south-eastern wheatbelt from Kulin to east of Hyden.

**Habitat:**—Grows in gravelly sand in heath (kwongan) dominated e.g. by *Allocasuarina*.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed.



**FIGURE 21.** *Daviesia elongata*. A. Flowering branchlet. B. Infructescence. C. Pod. *Daviesia implexa*. D. Flowering branchlet. E. Infructescence. A from Royce 4688; B, C from Crisp 5360; D, E from Crisp 5540. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Selected specimens (16 examined):**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Roe:** Near Newdegate, 33°10'S, 119°E, *W.E. Blackall 1281*, 7 November 1931 (PERTH); N of Lake Grace township, 32°40'S, 118°20'E, *P. Wilson 3430*, 21 September 1964 (AD, CANB); E of Newdegate, 33°10'S, 119°10'E, *J.M. Taylor 2293 & P. Ollerenshaw*, 26 September 1983 (CBG, MEL); Lake Grace, 33°10'S, 118°30'E, *W.E. Blackall 3178*, September 1933 (PERTH); W of Lake Grace, 33°10'S, 118°20'E, *M.D. Crisp 5540*, 28 January 1979 (AD, CBG, K, MEL, MO, PERTH).

**Affinity:**—Although previously included as a subspecies of *D. elongata*, this taxon differs sharply in the size of the bracts, the twisted and apically hooked phyllodes, and in the upper 2 calyx lobes. In *D. elongata* these lobes are broadly rounded and recurved, touching the adjacent lower lobes, but *D. implexa* has a broad, truncate lip. *Daviesia implexa* could be confused with *D. longifolia*, *D. pauciflora* or *D. costata* because all four species have linear decurrent phyllodes and a similar habit. However, none of the other three species has spirally twisted or hooked phyllodes like those of *D. implexa*. *Daviesia longifolia* and *D. pauciflora* also differ from *D. implexa* in having one or more prominent longitudinal nerves between the midrib and margin; sometimes phyllodes of these species may be < 2 mm broad, in which case they are terete or oblong in transection. Even the narrowest phyllodes of *D. implexa* are horizontally compressed.

**20. *Daviesia elongata*** Bentham (1864: 74), (Crisp 1995: 1189), Wheeler *et al.* (2002: 743). Type: 'W. Australia, Drummond, 2nd Coll. n. 136.' Lectotype (Crisp 1995: 1189): K (ex Herb. Hooker, annotated 'Negative no. Kew 911'); isolectotype: BM, E, G, K (ex LINN), K (ex Herb. Bentham), LD, MEL, P, PERTH, U, W

Spreading or sprawling *shrubs* with many tangled stems from a common rootstock, 0.5–1 m high and up to 1 m broad, glabrous, glaucous. *Root anatomy* normal (unistelar). *Branchlets* compressed-angular to tetragonous, prominently ribbed. *Phyllodes* scattered, erect, narrowly obovate or elliptic to linear, tapering to the acute apex and also to the inarticulate decurrent base, 40–170 × 4–15 mm, green; midrib prominent, lateral venation obscure. *Unit inflorescences* 1 per axil, racemose, 2- or 3-flowered; *peduncle* 8–12 mm long; *rachis* 1–2 mm long; *subtending bracts* linear, leaf-like, ca. equal in length to flowers at anthesis, enlarging to ca. 20 mm long in fruit; venation prominently reticulate; *barren bracts* scattered along peduncle, appressed, triangular, ca. 1 mm long. *Pedicels* 2–7.5 mm long. *Calyx* with the upper 2 lobes united into an emarginate lip, broadly rounded, recurved and touching the adjacent lower lobe; lower 3 lobes triangular, ca. 0.75 mm long. *Corolla: standard* transversely elliptic, emarginate, 10–11.5 × 8–12 mm including the 3–4 mm claw, rich yellow to yellow-orange with a red ring around the oblong yellow centre; *wings* obovate, rounded and incurved at apex and enclosing the much shorter keel, auriculate, 8.5–11 × 3–4.5 mm including the ca. 3 mm claw, maroon, fading to orange-yellow at the tips; *keel* half transversely very broadly obovate, acute, saccate, ca. 6.5 × 2–3 mm including the 2.5–3 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly obtriangular, compressed, acuminate, 15–17 × 7–8 mm; upper suture slightly sigmoid; lower suture acute. *Seed* ellipsoid, ca. 4 mm long, 2.5 mm broad, 1.5 mm thick, light brown; *aril* ca. 2.5 mm long. (Fig. 21A–C).

**Flowering period:**—September to January. *Fruiting period:* October to January.

**Distribution:**—Known only from the Busselton area, Western Australia.

**Habitat:**—Grows in pale brown sand on flat terrain in heath understorey of open forest dominated by *Eucalyptus marginata* and *Corymbia calophylla*.

**Conservation status:**—National: Vulnerable. WA: Vulnerable, Declared Rare Flora.

**Additional specimens examined:**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Darling:** SW of Busselton, 33°40'S, 115°10'E, *R.D. Royce 4688*, 25 October 1953 (PERTH); *ibid.*, *C.A. Gardner 5572*, 12 September 1940 (PERTH); *ibid.*, *M.D. Crisp 5360*, 21 January 1979 (AD, CBG, K, MEL, MO, NSW, PERTH); WA, *J. Drummond 44* (MEL 78035).

**Affinity:**—*Daviesia implexa* was previously included as a subspecies of *D. elongata* but differs qualitatively in several characters including pruinose vegetative parts, twisted and apically hooked phyllodes, much smaller (≤ 2 mm long) subtending bracts that do not enlarge in fruit, and in the upper 2 calyx lobes. In *D. elongata* these lobes are broadly rounded and recurved, touching the adjacent lower lobes, but *D. implexa* has a broad, truncate lip.

*Daviesia costata*, *D. longifolia* and *D. pauciflora* are similar in their straggling, tangled growth habit, and in

having linear decurrent phyllodes, but all three species have small ( $\leq 2$  mm long) non-enlarging bracts, a calyx with  $\pm$  equal lobes, and individual differences as follows. *Daviesia costata* differs in having a smaller calyx (3.5–5 mm long, including receptacle) with ten conspicuous ribs. *Daviesia longifolia* differs mainly in having a larger inflorescence (4–15-flowered) and a generally longer peduncle and rachis that are (4–)10–17 mm and (0–)6–28(–150) mm long respectively, and a smaller calyx (3–4 mm long, including the receptacle). *Daviesia pauciflora* has much longer (to 400 mm long) and narrower (to 1.5 mm broad) phyllodes than *D. elongata*, and often has a pair of flowers at the apex of the inflorescence, unlike *D. elongata*. Also, *D. pauciflora* has an auriculate keel, whereas that of *D. elongata* is vestigial.

**21. *Daviesia alternifolia*** Endlicher (1838: 11), Bentham (1864: 73), Crisp (1995: 1169), Wheeler *et al.* (2002: 742). Type: ‘Habitat in Novae Hollandiae austro-occidentalis colonia King-Georges-Sound (*Huegel*).’ Type specimen unknown—Endlicher types were in W, but many were destroyed in 1945. Neotype (Crisp 1995: 1169): Western Australia, 1.5 km along Nutcracker Road from Denmark–Mt Barker road, 34°51’S, 117°22’E, *J.M. Powell 3160, J. Everett & D. Bedford*, 13 November 1985 (CANB); isoneotype: NSW

*Daviesia ternata* Endlicher (1838: 11). *Daviesia alternifolia* Endl. var. *ternata* (Endl.) E.Pritz. in Diels & E. Pritzel (1904: 247). Type: ‘Habitat in Novae Hollandiae austro-occidentalis colonia King-Georges-Sound (*Huegel*)’ (W†). The type is missing, presumably destroyed in 1945. Neotype (Crisp 1995: 1169): Western Australia, Eyre, 7.5 km W of Annie Peak, 33°51’S, 119°54’E, *M.D. Crisp 5012*, 10 January 1979 (CBG); isoneotype: K, PERTH.

Dense, spreading, multi-stemmed *shrubs*, to 0.35 m high, minutely hispid on vegetative parts. *Root anatomy* normal (unistelar). *Branchlets* spreading, terete, ribbed. *Phyllodes* scattered, ascending, obovate to narrowly so, acute, mucronate, tapering to the inarticulate base, 25–50(–64)  $\times$  4–13 mm; marginal nerves and midrib very prominent, thickening towards the base; venation reticulate, prominent; *stipules* visible, often fused to the base of the phyllodes, ca. 0.5–2 mm long. *Unit inflorescences* in the upper axils, umbellate, 2- or 3-flowered, subtended by an involucre of 3 large, elliptic herbaceous bracts that are minutely hispid, 9–13 mm broad, enlarging in fruit to 17–27 mm broad and becoming scarious; *peduncle* thickening towards the apex, hispid, 10–50 mm long; *barren bracts* appressed, scattered along the peduncle, oblong, ca. 3 mm long. *Pedicel* hispid, ca. 2–3 mm long. *Calyx* 6–7 mm long including the 1.5–2 mm receptacle, hispid; upper 2 lobes united into a broad, truncate lip, apex acuminate, ca. 2 mm long; lower 3 lobes triangular, acuminate, ca. 2 mm long. *Corolla: standard* transversely elliptic, emarginate, cordate, 10–12  $\times$  11–15 mm including the ca. 3 mm claw, orange, infused with red that darkens toward the abruptly greenish-yellow centre; *wings* obovate with rounded, incurved apices but not enclosing the keel, auriculate, 8–11  $\times$  2.5–4 mm including the 3–3.5 mm claw, maroon; *keel* half depressed-obovate, scarcely acute, inflated, slightly auriculate, saccate, ca. 6–7  $\times$  3 mm including the 2–2.5 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slightly narrower, terete filaments and versatile anthers with confluent thecae; outer whorl of 5 with shorter, slightly broader, compressed filaments and basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, compressed, ca. 10  $\times$  6 mm; upper suture sigmoid; lower suture obtuse. *Seed* not seen. (Fig. 22).

**Flowering period:**—Mainly September to January, though the occasional plant flowers in July. *Fruiting period:* From November.

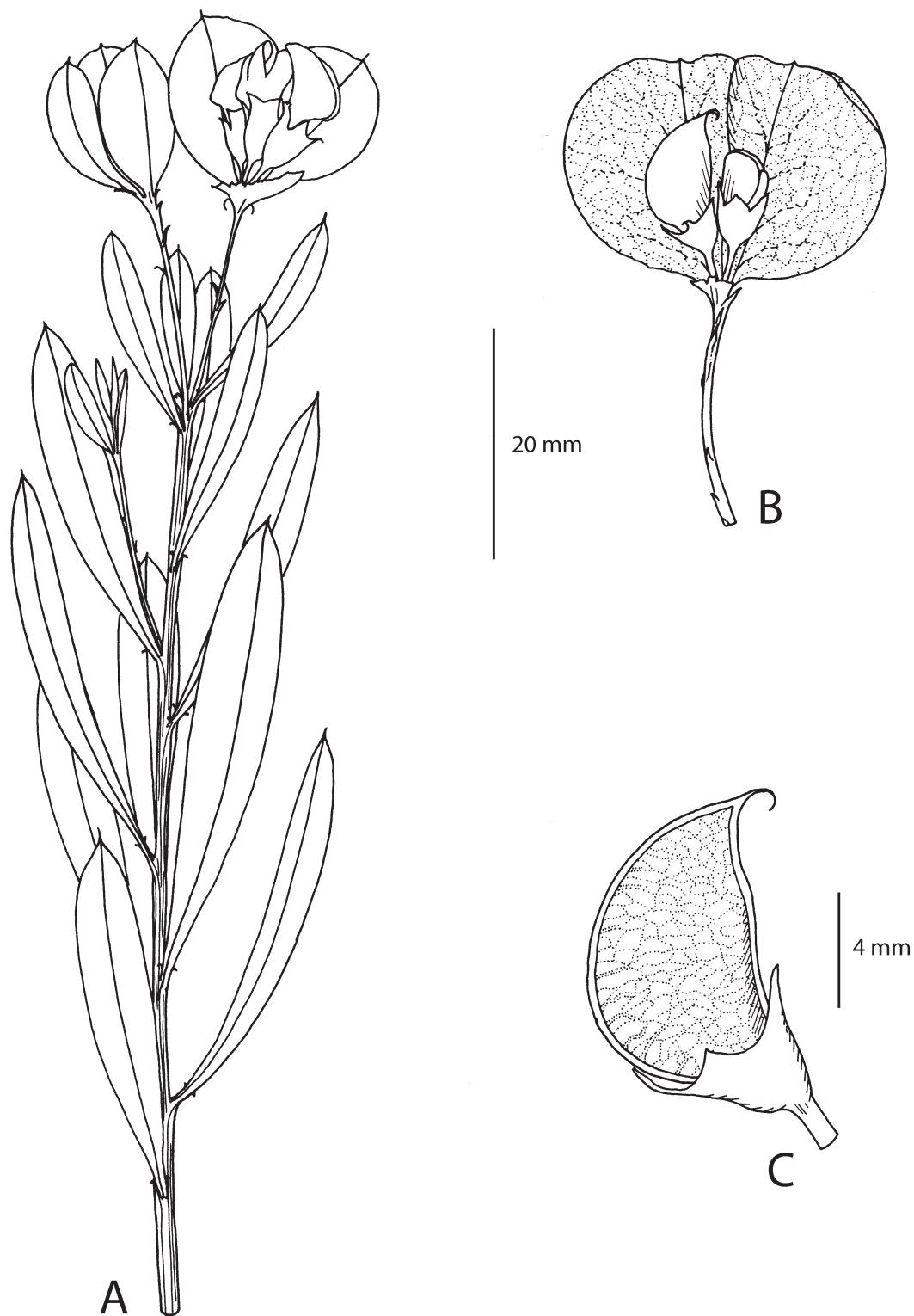
**Distribution:**—Western Australia, south coast and hinterland, mainly from Denmark north-east to the Stirling Range and east to Fitzgerald River National Park (south of Ravensthorpe), with sporadic records as far west as Rosa Brook, south of Busselton.

**Habitat:**—Grows on white sand, loamy sand with quartz pebbles or laterite, from the top of coastal cliffs to slopes of mountains, in low heath dominated by *Hakea* H.A. Schrader & J.C. Wendland (1798: 27), *Kingia* (Brown 1826: 211) and *Lambertia* Smith (1798: 214), sometimes with emergent *Eucalyptus staeri* (Maiden 1914: 230) Kessell & Gardner (1924: 110).

**Selected specimens (72 examined):**—**WESTERN AUSTRALIA. Darling:** Hay River, 34°43’S, 117°35’E, *Colonel Goadby B.2466*, October 1899 (PERTH); lower slopes of Mt Manypeaks, 34°53’S, 118°15’E, *J. Taylor 1937 & P. Ollerenshaw*, 18 September 1983 (CBG, MEL, PERTH). **Eyre:** Whoogarup Range, 33°55’S, 119°50’E, *K.M. Allan 179*, 8 November 1969 (CANB, PERTH); *ibid.*, *A.S. George 1916*, 2 December 1960 (CANB, PERTH); 16 km W of Bremer Bay, 34°23’S, 119°13’E, *T.E.H. Aplin 2744*, 30 October 1963 (MEL, PERTH); ca. 50 km along Highway 1 from Albany to Jerramungup, 0.5 km SW of Cheyne Beach turn-off, 34°49’S, 118°15’E, *M.D.*



*Crisp 5079*, 13 January 1979 (CBG); between Ravensthorpe and Hamersley River, *R. Gray s.n.*, 31 December 1923 (PERTH 5189268); 29 km E of Cranbrook, Chester Pass Road, 34°19'S, 117°50'E, *A.S. George 402*, 14 November 1959 (PERTH); near Chester Pass, Stirling Ranges [*sic*], on road to Albany, 34°23'S, 118°06'E, *M.E. Phillips s.n.*, 10 October 1962 (CBG 22136).



*A. Prowse*

**FIGURE 22.** *Daviesia alternifolia*. A. Flowering branchlet with proximal involucre removed. B. Inflorescence with enlarged involucre, proximal one removed. C. Pod. A from *Phillips s.n.* (CBG 22136); B, C from *George 402*. Drawn by A.L. Prowse.

**Affinity:**—*Daviesia alternifolia* is similar to *D. oppositifolia* and *D. ovata*. *Daviesia oppositifolia* has whorled phyllodes that are generally larger (37–122 × 11–37 mm) than in *D. alternifolia* and lacks visible stipules; also, the mature involucre bracts of *D. oppositifolia* are coriaceous, whereas those of *D. alternifolia* are scarious. The unit inflorescences of both *D. oppositifolia* and *D. ovata* are racemose with more flowers (5–10 and 8–11 respectively), and peduncle, pedicel and calyx are glabrous. Additionally, *D. ovata* differs from *D. alternifolia* in having much broader phyllodes (14–37 mm broad) with a cuneate base.

**22. *Daviesia oppositifolia*** Endlicher (1838: 11), Bentham (1864: 73). Type: ‘Habitat in Novae Hollandiae austro-occidentalis colonia King-Georges Sound (*Huegel*).’ No specimen was located—Endlicher types were in W but many were destroyed in 1945. Neotype (Crisp 1995: 1217): Western Australia, 60 km NE of Albany on road to Jerramungup, 34°40’S, 118°16’E, *D.J.E. Whibley 5216*, 10 November 1974 (AD); isoneotype: PERTH

Erect *shrubs* to 2 m high, glabrous. *Root anatomy* unknown. *Branchlets* ascending, terete to triquetrous, lightly ribbed. *Phyllodes* opposite or ternate or scattered, ascending, obovate to narrowly so, apically acute to rounded, contracted to a petiole-like inarticulate base, 37–122 × 11–37 mm; venation prominently reticulate. *Unit inflorescences* 1 or 2 per axil, condensed-racemose, 5–10-flowered, subtended by a whorl of 3 large convex herbaceous *involucre bracts* that are 10–13 mm broad, enlarging to 15–20 mm broad, enclosing the pods and becoming coriaceous, initially green, becoming deep copper-maroon at anthesis and bleaching to a light copper colour in fruit; *peduncle* 28–43 mm long; *rachis* 2–2.5 mm long; *subtending bracts* ascending, triangular, ca. 1.5 mm long; *barren bracts* scattered along the peduncle, ascending, triangular, ca. 1.5 mm long. *Pedicels* 3.5–6 mm long. *Calyx* 4–5 mm long including the ca. 1.5 mm receptacle; upper 2 lobes obliquely triangular, ca. 1 mm long; lower 3 lobes triangular, ca. 0.5 mm long. *Corolla: standard* transversely elliptic, emarginate, ca. 6 × 5.5–6 mm including the 2 mm claw, yellow with dark maroon markings around a central yellow blotch; *wings* obovate, apex rounded, auriculate, ca. 5–5.5 × 2 mm including the 2–2.5 mm claw, maroon with yellow tips; *keel* half circular, acute, saccate, ca. 4.5–5.5 × 1.5 mm including the 2–2.5 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and shorter, round, subversatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly to very broadly obtriangular, acute, compressed, 9–11 × 6–10 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, ca. 4 mm long, 3 mm broad, 2.5 mm thick, light greenish-brown with light mottling or brown with no mottling; *aril* ca. 2.5 mm long. (Fig. 23).

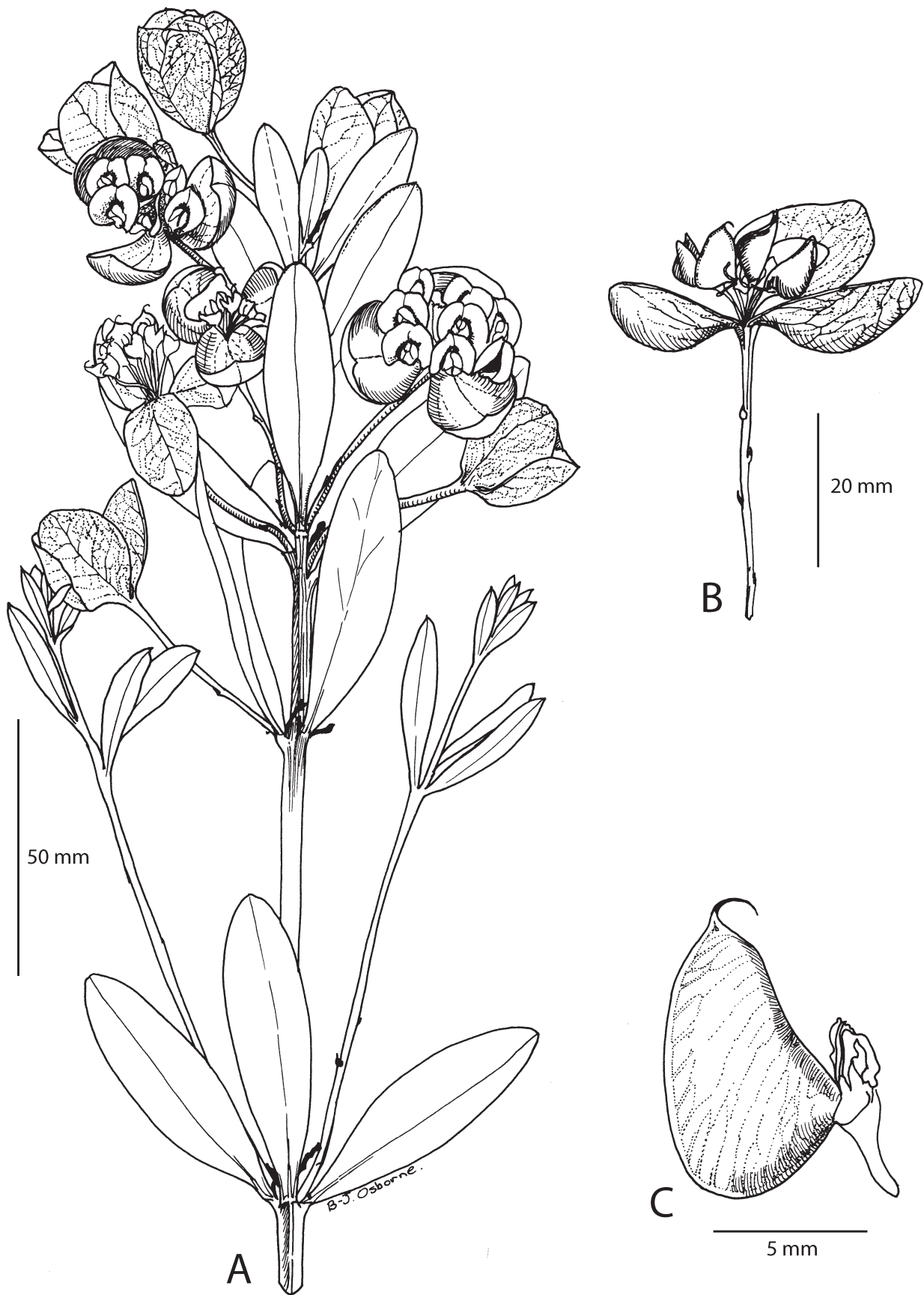
**Flowering period:**—March to November. *Fruiting period:* October to January.

**Distribution:**—Western Australia, southern districts, mainly Stirling Range; also near Denmark and Cheyne Beach.

**Habitat:**—Grows in skeletal sandy loam in open forest dominated by *Eucalyptus* spp.

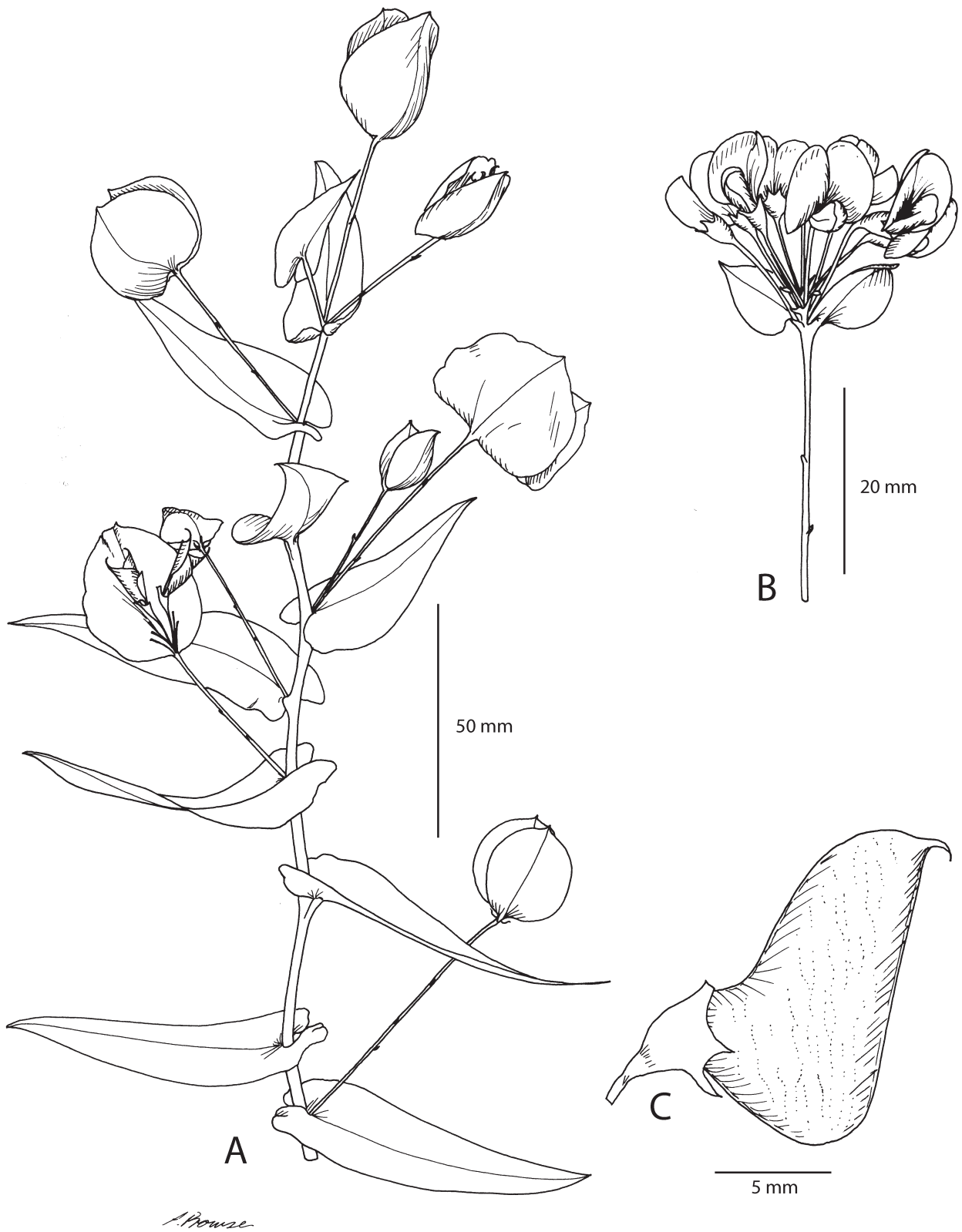
**Selected specimens (39 examined):**—WESTERN AUSTRALIA. **Eyre:** New transverse road, Stirling Range National Park, *F.A. Spratt 33*, March 1966 (PERTH); Warrenup foothills, *F.A. Spratt 3*, 7 January 1964 (PERTH); Warrungup to Ellen Peak, *A. Morrison s.n.*, 16 October 1902 (PERTH 5189543); 58 km from Albany towards Cape Riche, *J.W. Wrigley WA/68 4939*, 25 October 1968 (CBG, PERTH); Stirling Range, 2.7 km N of Ellen Peak, *M.D. Crisp 5282*, 19 January 1979 (CBG, PERTH); ca. 8 km E of Cheyne Beach turnoff, 34°45’S, 118°20’E, *H. Demarz D6689*, 24 November 1977 (PERTH).

**Affinity:**—Similar to *D. alternifolia* and *D. ovata*. *Daviesia alternifolia* has scattered phyllodes that are generally smaller (25–50[–64] × 4–13 mm) than in *D. oppositifolia*, and has visible stipules; also, the mature involucre bracts of *D. alternifolia* are scarious, whereas those of *D. oppositifolia* are coriaceous. The inflorescence of *D. alternifolia* is umbellate, with a smaller number of flowers (two or three) per inflorescence, and the peduncle, pedicel and calyx are hispidulous. *Daviesia ovata* has phyllodes that do not taper but are abruptly contracted to a petiole-like base, and are much broader (14–37 mm broad). Also, *D. ovata* has two (not three) flat herbaceous bracts that are generally broader (18–35 mm broad) and paper-thin, unlike the thicker, coriaceous bracts of *D. oppositifolia*.



**FIGURE 23.** *Daviesia oppositifolia*. A. Flowering branchlet. B. Infructescence with involucral bracts opened to show pods. C. Pod. A from Wrigley WA/68 4939; B, C from Crisp 5282. Drawn by B-J. Osborne.

23. *Daviesia cordata* Smith (1808b: 259), Bentham (1864: 72), Crisp (1987a: 248), Crisp (1995: 1183), Wheeler *et al.* (2002: 742). *Mirbelia cordata* (Sm.) G.A. Pritzel (1855: 718). Type: ‘This is a native of the country near King George’s Sound...’ Holotype: LINN; isotypes: BM, LIV, MO



**FIGURE 24.** *Daviesia cordata*. A. Fruiting branchlet, showing involucres enlarged to enclose pods. B. Inflorescence. C. Pod. A, C from Crisp 5348; B from Crisp 1050. Drawn by A.L. Prowse.

Slender, often single-stemmed *shrubs* to 1.5 m high, glabrous. *Root anatomy* normal (unistelar). *Branchlets* ascending, terete, lightly ribbed. *Phyllodes* scattered, spreading, ovate to occasionally broadly so, attenuate to a long acuminate apex, margins shallowly to deeply crenulate, basally cordate and amplexicaul, rarely hastate, articulate at the thickened node, decurrent, 35–150 × 22–85 mm; venation prominently reticulate. *Seedling phyllodes* ± alternate, gradually becoming scattered and cordate after 4 or 5 nodes, 45–95 × 25–50 mm. *Unit inflorescences* 1 or more per axil, corymbiform, 10–15-flowered; *peduncle* 20–70 mm long, with a pair of circular, herbaceous *involucral bracts* at the summit, these 5–15 mm broad, basally truncate to cordate, becoming scarious and enlarging to 25–50 mm broad to enclose pods, prominently reticulate; *subtending bracts* spreading to ascending, oblong, ca. 1 mm long; *barren bracts* scattered along the peduncle, spreading, oblong, ca. 1 mm long. *Pedicel* 4–6.5 mm long. *Calyx* 6–7 mm long including the 1–1.5 mm receptacle; upper 2 lobes united into a broad, truncate, emarginate lip, ca. 1.5 mm long; lower 3 lobes triangular, ca. 1.5 mm long. *Corolla: standard* circular to transversely elliptic, emarginate, 10–12 × 9–15 mm including the ca. 3 mm claw, yellow towards the base and lateral margins, infused with orange towards the apex and centre, with a deeper yellow bilobed centre outlined in maroon; *wings* obovate with a rounded, incurved apex, auriculate, 9.5–10.5 × 3–4.5 mm including the ca. 3 mm claw, pinkish red to purple; *keel* half broadly elliptic, beaked, saccate, 8–9 × 2.5 mm including the 2–2.5 mm claw, pinkish purple. *Stamens* slightly dimorphic: anthers all basifixed; inner whorl of 5 with slightly shorter filaments and rounder anthers with confluent thecae; outer whorl of 5 with slightly longer filaments and oblong, 2-celled anthers; vexillary anther with confluent thecae; filaments all compressed, cohering. *Pod* obliquely shallowly obtriangular, compressed, apex acute, with a persistent mucro-like style, 12–16 × 8–11 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, longitudinally compressed, ca. 5–5.5 mm long, 3–3.5 mm broad, 2 mm thick, light brown to black, with no mottling; *aril* ca. 3–3.5 mm long. (Fig. 24).

**Flowering period:**—July to December. *Fruiting period:* December to February.

**Distribution:**—Western Australia, common through the Jarrah forest of the Darling Range from a little north of Perth to the far south-west and east to Albany, with rare occurrences in the wheatbelt, e.g. Boyagin Rock and Tutanning Reserve.

**Habitat:**—Grows in a variety of sandy and gravelly soils, in *Eucalyptus* (especially *E. marginata*) dominated open forest or mallee-heath.

**Selected specimens (145 examined):**—**WESTERN AUSTRALIA. Avon:** Boyagin Rock Reserve, 4.5 km E of Beverley–Williams road, 32°29'S, 116°52'E, *M.D. Crisp* 6662, 22 July 1980 (CBG); H-8 vicinity, Tutanning Reserve, 27 km E of Pingelly, 32°32'S, 117°22'E, *G. Heinsohn* 68, 16 October 1967 (PERTH). **Eyre:** Mt Barker, Rocky Gully road, 34°39'S, 117°39'E, *A.M. Ashby* 2013, 14 October 1966 (AD, SI, WRSL); Mt Barker, Kerongerups [*sic*], 34°39'S, 117°39'E, *F.J.H. Mueller s.n.* (MEL 77849). **Darling:** Darling Range scarp, near Wattle Grove (Perth), just S of Welshpool Road, 32°01'S, 116°02'E, *M.D. Crisp* 1050, 13 August 1965 (AD, CBG, PERTH); ca. 50 km N of Walpole, on the Lake Muir Road, 34°30'S, 116°38'E, *R. Pullen* 9962, 11 December 1974 (CANB); Helena Valley, 32°00'S, 116°20'E, *J. Seabrook* 215, 7 September 1977 (PERTH); 20 km N of Boddington, Bannister Hill, 32°38'S, 116°29'E, *M.D. Crisp* 5388, 22 January 1979 (CBG, PERTH); 23 km from Pemberton along road to Nannup, Tobruk Road turnoff, 34°25'S, 115°49'E, *M.D. Crisp* 5348, 21 January 1979 (CBG, MEL, PERTH).

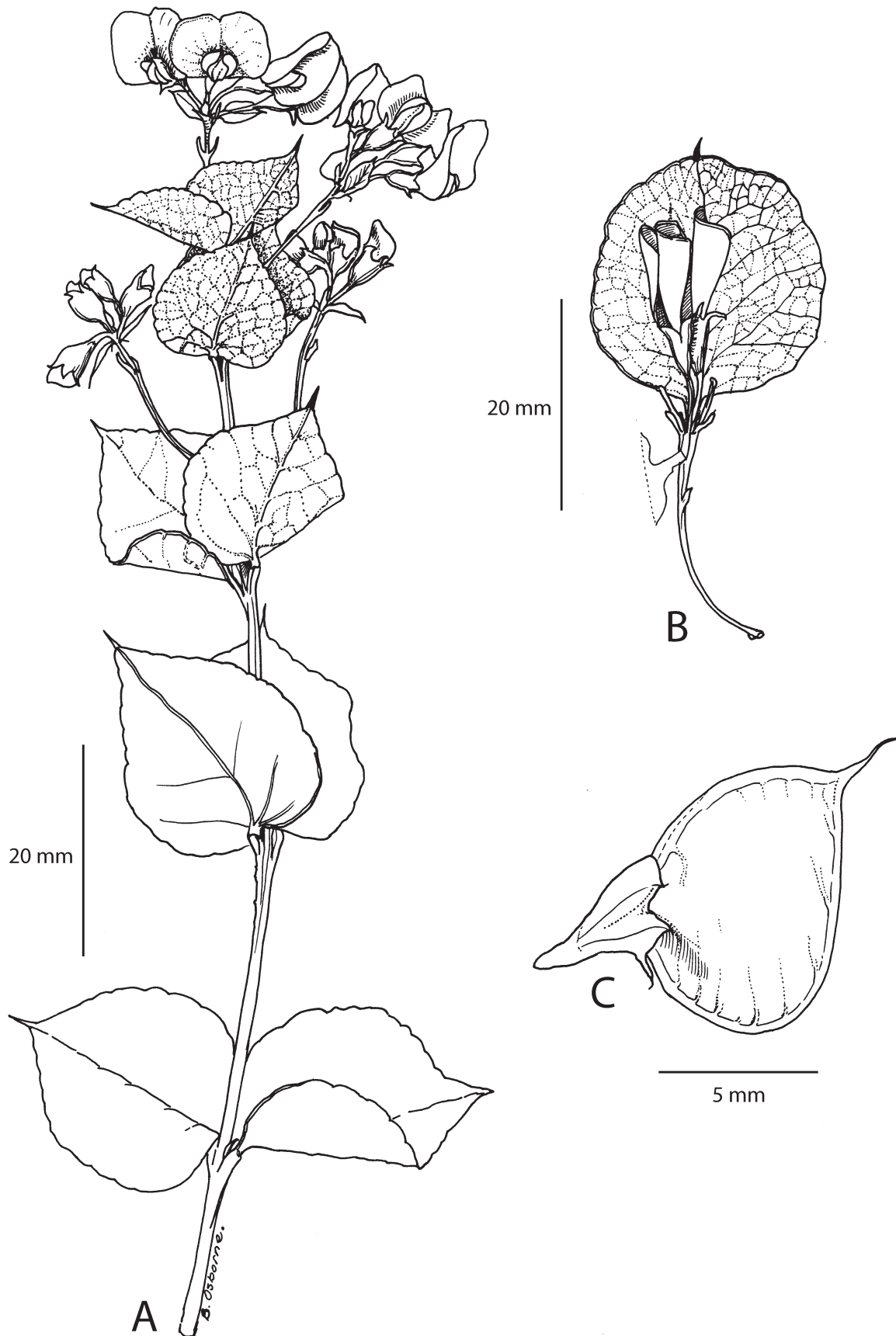
**Affinity:**—The distinctive cordate, amplexicaul, attenuate phyllodes of *D. cordata* readily distinguish it from all other species in the genus. *Daviesia crenulata* has basally truncate or slightly cordate phyllodes with reticulate venation and the apex is more or less pungent and shortly acuminate, not attenuate.

**24. *Daviesia crenulata*** Turczaninow (1853: 265), Bentham (1864: 72), Crisp (1995: 1185). Type: 'Drum. V. n. 40.' Holotype: KW; isotypes: BM, G (2 sheets), K (2 sheets), MEL, P, RI, W

*Daviesia calystegia* Turczaninow (1853: 264). Type: 'Drum. IV. n. 30.' Holotype: KW; isotypes: MB, FI-W, G (2 sheets), K (3 sheets), MEL, OXF, P (2 sheets), W.

*Daviesia parifolia* Mueller (1863: 16). Type: 'In collibus glareosis Kojonurup dictis. Maxw.' Holotype: MEL.

Bushy *shrubs*, to 0.8 m high, hirsute or shortly so, mainly on branchlets. *Root anatomy* unknown. *Branchlets* spreading to ascending, terete, prominently ribbed. *Phyllodes* scattered to opposite, spreading, ovate, broadly ovate or transversely broadly ovate, 15–31 × 14–35 mm; apex acute or acuminate and ± pungent; margins usually deeply crenulate; base truncate or slightly cordate with a short (1–2 mm) pseudo-petiole, articulated at the thickened node,



**FIGURE 25.** *Daviesia crenulata*. A. Flowering branchlet. B. Infructescence with proximal involucre removed. C. Pod. A from Nelson 17388; B from Crisp 5261; C from George 3110. Drawn by B-J. Osborne.

shortly decurrent; lamina glabrous except occasionally a few short hairs along the veins towards the base; venation prominently reticulate. *Unit inflorescences* 1 per axil, umbellate, 2–4-flowered; *peduncle* 17–55 mm long, with a pair of circular, herbaceous *involucral bracts* at the summit, these 3–5 mm broad, becoming scarious and enlarging to ca. 20 mm broad and enclosing pod, venation prominently reticulate; *subtending bracts* spreading, oblong, ca. 1 mm long; *barren bracts* scattered along peduncle, appressed to ascending, oblong, ca. 1 mm long. *Pedicel* 2.5–3.5 mm long. *Calyx* 4.5–5.5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united in a truncate, deeply emarginate lip, apex acuminate, ca. 1.5 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* transversely elliptic, emarginate, 7–8.5 × 10–11.5 mm including the 2–2.5 mm claw, yellow to orange with a maroon infusion around the yellow centre; *wings* elliptic with a rounded apex, auriculate, 6–6.5 × 2–2.5 mm including the 2.5 mm claw, maroon; *keel* half transversely elliptic, scarcely acute, inflated, saccate, 5.5 × 2.5 mm including the 2 mm claw. *Stamens* moderately dimorphic: inner whorl of 5 with longer, slender filaments and rounder anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and oblong, 2-celled anthers; filaments all compressed; cohering. *Pod* obliquely shallowly to very broadly obtriangular, apex acute, 10–11 × 7–9 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, ca. 4 mm long, 3 mm broad, 2.5 mm thick, brown to black; *aril* ca. 2.5 mm long. (Fig. 25).

**Flowering period:**—September and October. *Fruiting period:* October and November.

**Distribution:**—Western Australia, throughout the Stirling Range and an isolated record from near Tunney, between Cranbrook and Kojonup.

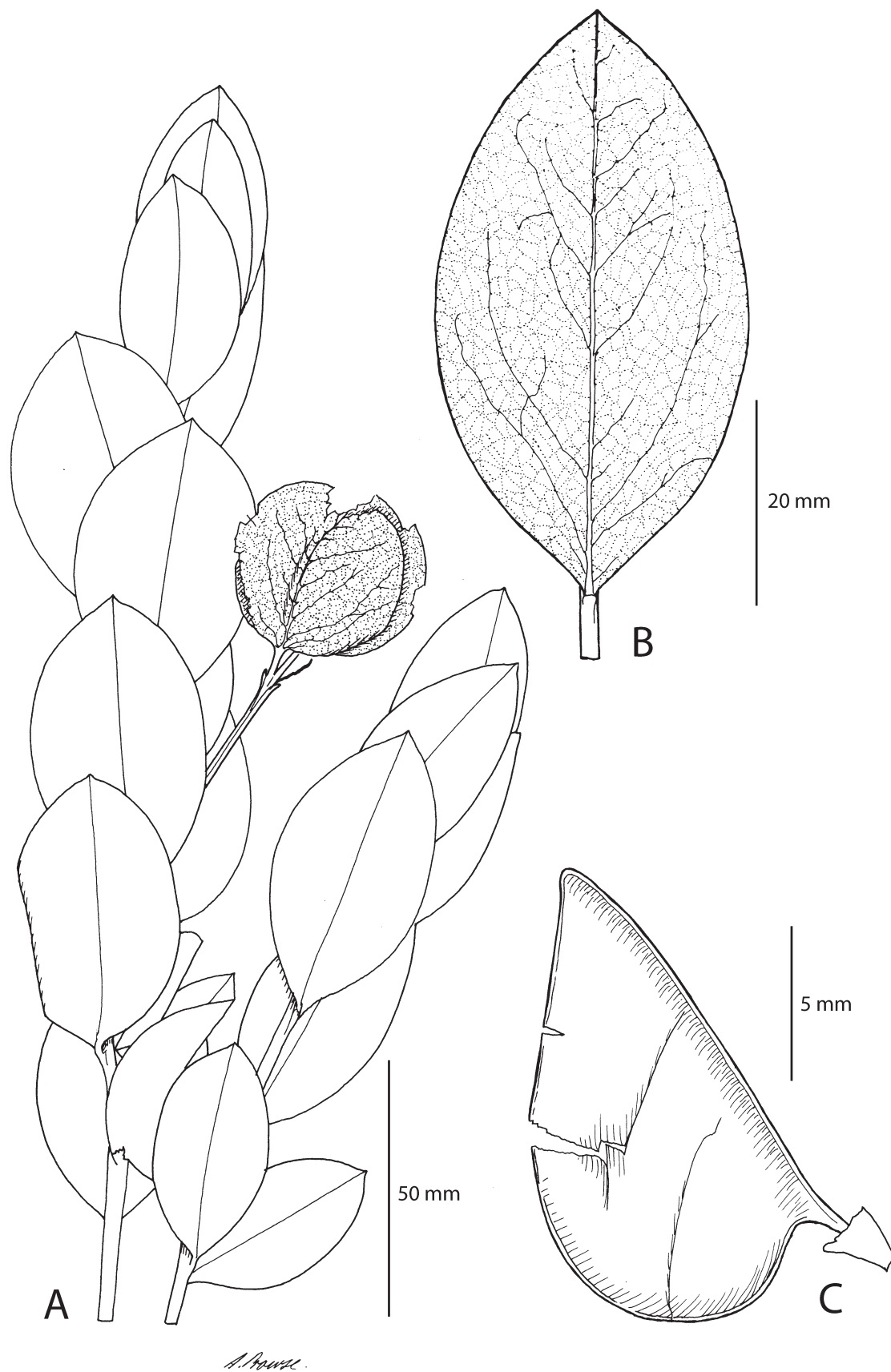
**Habitat:**—Grows in gravelly or rocky sandy loam on hillsides in heath, mallee–heath or forest dominated *Eucalyptus*.

**Selected specimens (27 examined):**—WESTERN AUSTRALIA. **Eyre:** Mt Mistake, Stirling Range, 34°30'S, 118°00'E, *E.C. Nelson 17388*, 25 September 1973 (CANB, PERTH); Red Gum Springs, Stirling Range National Park, 34°22'S, 117°45'E, *J.W. Wrigley WA/68 4358*, 10 October 1968 (CBG); 4 km W of Tunney, 34°07'S, 117°22'E, *W.J. Whittaker s.n.*, October 1968 (PERTH 5209986); N side of Bluff Knoll, Stirling Range, 34°22'S, 118°15'E, *A.S. George 3110*, 12 November 1961 (PERTH); 2 km S of Wedge Hill, Stirling Range, 34°26'S, 118°10'E, *M.D. Crisp 6125 et al.*, 25 September 1979 (CBG, K, PERTH); Stirling Range, junction of East Pillenurup and South Bluff Tracks, 34°25'S, 118°15'E, *M.D. Crisp 5261*, 18 January 1979 (CBG).

**Affinity:**—*Daviesia crenulata* is distinguished from most other species that have a conspicuous, accrescent involucre at the base of the inflorescence (*D. alternifolia*, *D. elongata*, *D. oppositifolia* and *D. ovata*) by its crenulate, slightly cordate phyllodes with acuminate, often pungent leaf tips. The remaining species in this group, *D. cordata*, is distinguished by its long, tapering, non-pungent phyllodes that are at least 2 × longer than broad, with deeply cordate, stem-clasping bases.

**25. *Daviesia ovata*** Bentham (1864: 72), Crisp (1995: 1217). Type: 'W. Australia, Drummond, n. 23.' Holotype: K; isotype: MEL

Dense, bushy *shrubs*, to 1.8 m high, glabrous. *Root anatomy* unknown. *Branchlets* ascending, angular to broadly so, prominently ribbed. *Phyllodes* scattered, ascending, ovate to elliptic, acute to slightly acuminate, mucronate, 28–77 × 14–37 mm; base cuneate with a short (1–2 mm) petiole-like stalk, inarticulate and decurrent; margins scarcely crenulate; venation prominently reticulate. *Unit inflorescence* 1 per axil, a condensed raceme, 8–11-flowered; *peduncle* angular, 14–30 mm long, topped by 2 circular, herbaceous *involucral bracts* that are 4–7 mm broad, enlarging in fruit to 18–35 mm and becoming scarious; *rachis* 5.5–7 mm long; *subtending bracts* ascending, narrowly triangular, 1–2 mm long; *barren bracts* scattered along the peduncle, narrowly triangular, 2–3 mm long. *Pedicels* 3.5–7 mm long. *Calyx* 4.5–5.5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united in a truncate, emarginate lip, ca. 1.5 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* transversely elliptic, emarginate, 7–8 × 8–9.5 mm including the 2–2.5 mm claw, orange with a small red ring around the yellow centre; *wings* oblong with a rounded and incurved apex enclosing the keel, auriculate, with a slight lobe on the abaxial margin, ca. 6.5–10.5 × 2.5 mm including the 2.5 mm claw, maroon; *keel* half circular, inflated, saccate, ca. 6 × 2 mm including the 2 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly obtriangular, acuminate, ca. 14 × 7 mm; upper suture slightly sigmoid; lower suture obtuse. *Seed* not seen. (Fig. 26).



**FIGURE 26.** *Daviesia ovata*. A. Branchlets with infructescence. B. Phyllode. C. Pod. A, B from *Drummond 23* (holotype); C from *Drummond s.n.* (MEL 79643 (?isotype)). Drawn by A.L. Prowse.



**Flowering period:**—September. *Fruiting period:* November and December.

**Distribution:**—Localised near the coast, east of Albany, Western Australia.

**Habitat:**—Grows among granite rocks on slopes or tops of rises in low mallee-heath or shrubland dominated by *Eucalyptus acies* Brooker and *E. marginata* with a large shrub understorey.

**Conservation status:**—National: Not listed. WA: Critically Endangered, Declared Rare Flora.

**Selected specimens (10 examined):**—Approximate locality data given because the species is rare.

**WESTERN AUSTRALIA. Darling:** E of Albany, 34°50'S, 118°20'E, *J. Taylor 1928* & *P. Ollerenshaw*, 18 September 1983 (CBG, MEL, PERTH); *ibid.*, *E. Swainson s.n.* & *D. Davidson*, 30 August 1983 (CBG 8316707); *ibid.*, *C.A. Gardner 3309*, 5 September 1935 (CANB, PERTH).

**Affinity:**—Similar to *D. alternifolia* and *D. oppositifolia*. *Daviesia alternifolia* differs in having obovate phyllodes that are much narrower (4–13 mm broad) and taper to the base, lacking a petiole-like stalk. Also, the unit inflorescence of *D. alternifolia* is umbellate with fewer flowers (two or three) and has hispid hairs on the peduncle, pedicels and calyx, unlike *D. ovata*. *Daviesia oppositifolia* has obovate phyllodes that taper to an often petiole-like base and has three (not two) large, herbaceous involucre bracts at the base of the inflorescence, and these are cucullate (not flat), smaller (ca. 15 mm broad when in fruit) and coriaceous in contrast to the paper-thin bracts of *D. ovata*.

**26. *Daviesia croniniana*** Mueller (1894a: 194), Mueller (1894b: 189), Crisp (1995: 1185). Type: 'Towards Lake-Lefroy; Cronin.' Holotype: MEL; isotype: K

Round, bushy *shrubs* 0.5–2 m high, branching in a regularly fasciculate pattern, densely hispid along branchlets, villous on phyllodes and calyces. *Root anatomy* normal (unistelar). *Branchlets* ribbed. *Phyllodes* erect in dense fascicles at branchlet tips, absent or reduced to scales below; fasciculate phyllodes erect, linear, compressed, ribbed, broadest near the apex and tapering to the base, cuspidate, with a thickened articulation at base, 28–50 × 1–2 mm. *Seedling phyllodes* ± evenly distributed along the branchlets at the base, becoming fasciculate at about 10 cm plant height, 15–25 × 2–3 mm. *Unit inflorescences* condensed racemes, 2- or 3-flowered; *peduncle* ca. 1.5 mm long; *rachis* < 0.5 mm long; *subtending and barren bracts* clustered at the base of the peduncle, lightly keeled, spreading at the tips. *Pedicels* 6–8 mm long. *Calyx* 4–5.5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united higher than the lower 3, either shallowly-triangular with slightly recurved lobes or rounded with markedly recurved lobes, ca. 1 mm long; lower 3 lobes triangular, ca. 0.75 mm long. *Corolla: standard* depressed-obovate, deeply emarginate, 9–11 × 10–12 mm including the 2–3 mm claw, yellow or orange, infused with red ring around the yellow centre; *wings* obovate with a rounded, incurved, overlapping apex, enclosing the apex of the keel, deeply auriculate, with a small lobe opposite the auricles on the abaxial margin, 7.5–8.5 × 3–4 mm including the 2.5–3 mm claw, maroon; *keel* half depressed-obovate with a ± obtuse apex, base saccate or not, 6 × 2.5–3 mm including the ca. 2 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with slightly longer filaments and shorter, rounder, versatile anthers with confluent thecae; outer whorl of 5 with slightly shorter, broader, compressed filaments and longer, narrower (oblong) 2-celled, basifixed anthers; filaments free. *Pod* obliquely very shallowly obtriangular, beaked, 12–14 × (7)8–9 mm; upper suture almost straight; lower suture acute. *Seed* not seen. (Fig. 27).

**Flowering period:**—August to January. *Fruiting period:* One specimen seen fruiting in November.

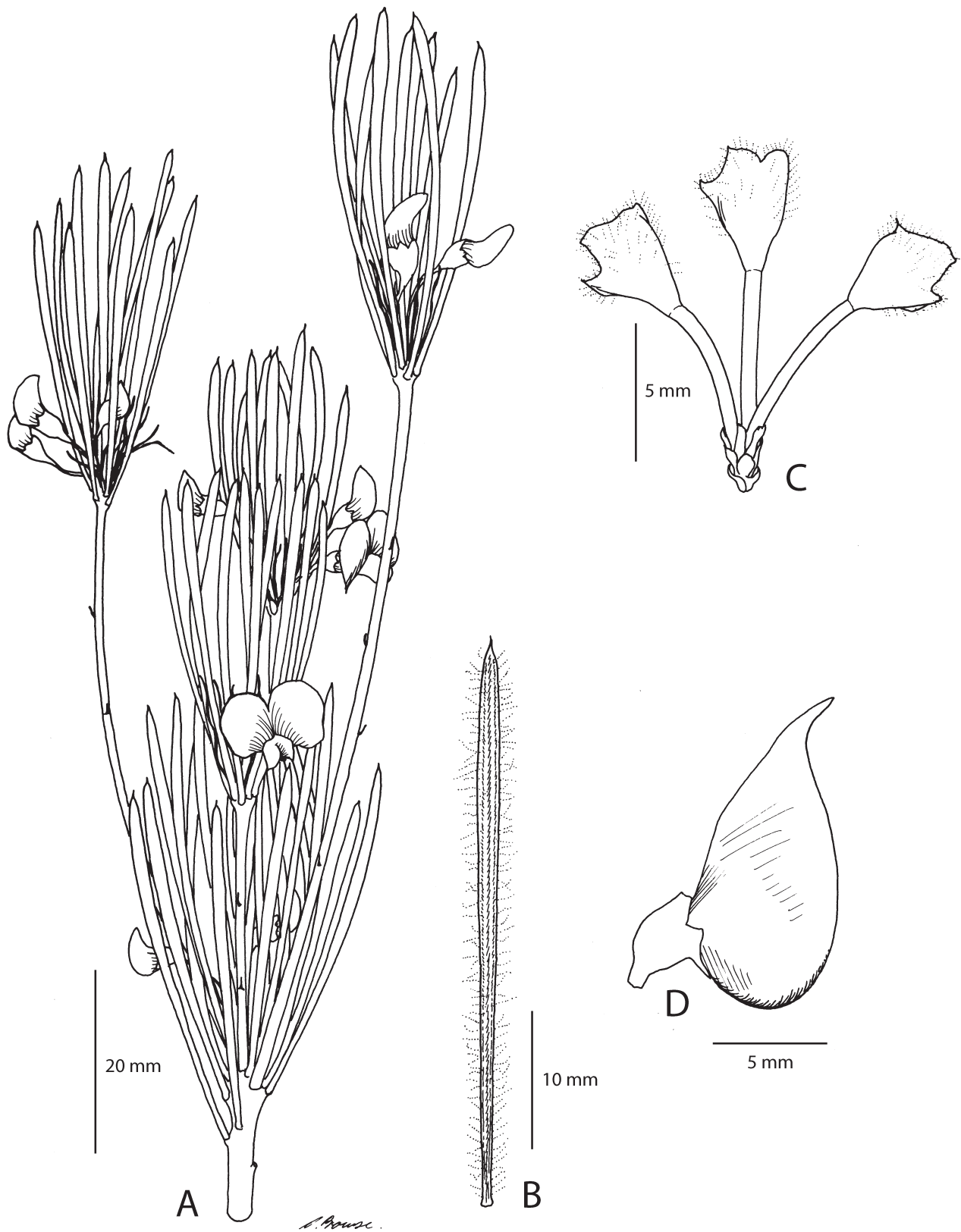
**Distribution:**—Western Australia, from the Coolgardie area south to Marble Rocks and west to Cunderdin.

**Habitat:**—Sand to gravelly sand on sandplains and kwongan heathland, usually dominated by mallee eucalypts, *Allocasuarina* and *Grevillea*.

**Selected specimens (55 examined):**—**WESTERN AUSTRALIA. Coolgardie:** Near Boorabbin, 294 mile peg Great Eastern Highway, 31°12'S, 120°19'E, *T.E.H. Aplin 1938*, 11 September 1962 (PERTH); 43 km SE of Marvel Loch on Mt Day Road, 31°42'S, 119°49'E, *B.H. Smith 529*, 6 November 1984 (CBG, HO, MEL, PERTH); 83 km W of Coolgardie, 31°11'S, 120°24'E, *M.E. Phillips WA/62 744A*, 17 September 1962 (CBG, L, PERTH).

**Roe:** Ca. 55 km E of Hyden, 4.5 km NE of Marble Rocks, 32°30'S, 119°27'E, *M.D. Crisp 5554*, 29 January 1979 (CBG, K, MEK, PERTH)

**Affinity:**—The combination of the distinctively fasciculate pattern of branching, the arrangement of the erect phyllodes into dense terminal fascicles with flowers emerging from the fascicle bases, and the densely villous indumentum, give these plants a unique appearance that could not be confused with any other species of *Daviesia*.



**FIGURE 27.** *Daviesia croniniana*. A. Flowering branchlet. B. Phyllode showing indumentum. C. Inflorescence with floral parts except calyces removed. D. Pod. A, B from *Aplin 1938*; B, C from *Crisp 5554*. Drawn by A.L. Prowse.

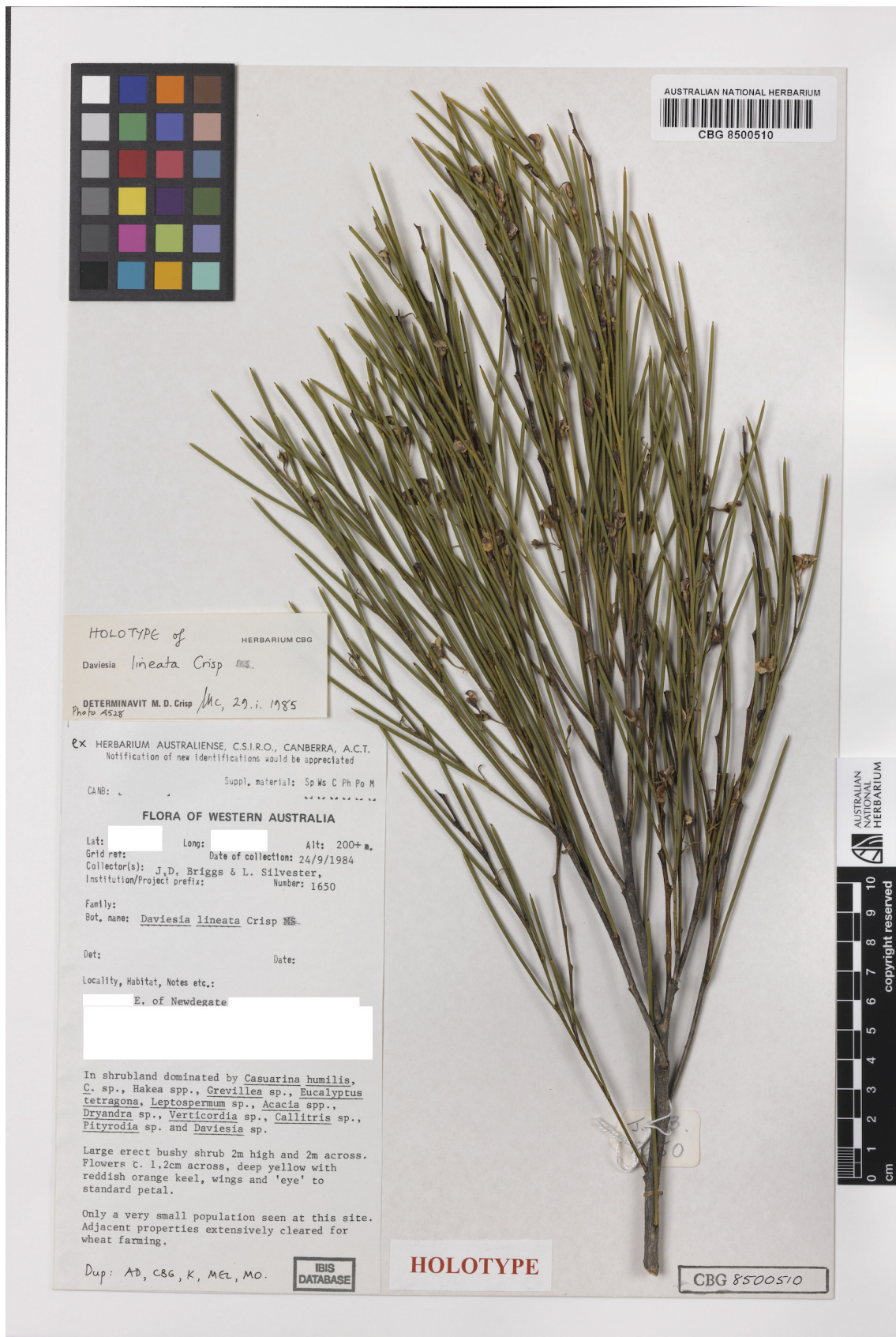


FIGURE 28. *Daviesia lineata*. Holotype. Photograph provided by the Curator of CANB.

**27. *Daviesia lineata*** Crisp (1995: 1207). Type [approximate locality data given because the species is rare]: Western Australia, Roe, E of Newdegate, 33°10'S, 119°20'E, *J.D. Briggs 1650 & L. Silvester*, 24 September 1984. Holotype: CBG; isotypes: AD, CANB, K, MEL, MO

Broom-brush shaped *shrubs*, with one to several stems, to 2.5 m high, minutely papillate. *Root anatomy* normal (unistelar). *Branchlets* erect, angular, ribbed. *Phyllodes* scattered, erect, terete, straight or gently curved, apically acicular and pungent, basally articulate, 30–110 mm long, 0.75–1 mm diam., finely striate even when fresh, green. *Unit inflorescences* 1 or 2 per axil, umbelliform, 1- or 2-flowered; *peduncle* 1.5–4 mm long; *rachis* 0–1 mm long; *subtending bracts* spreading at tips, oblong, ca. 1 mm long; *barren bracts* few, oblong, spreading at tips, ca. 0.75–1 mm long. *Pedicels* gently thickening upwards, 4–8 mm long. *Calyx* 4.5–6 mm long including the ca. 1.5 mm stipe-like receptacle; upper 2 lobes united in a broad, truncate, emarginate lip, ca. 1 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* very broadly ovate, emarginate, auriculate, 8–10 × 8.5–11 mm including the ca. 1.5 mm claw, with 2 small calli at the base of the lamina, rich yellow with dark red infusion towards centre and a bright yellow centre; *wings* obovate with uncinata auricles, 7–7.5 × 3–4 mm including the 1.5–2 mm claw, orange-red; *keel* half transversely broadly elliptic, scarcely acute, auriculate, slightly saccate, ca. 6.5 × 3 mm including the 1.5–2 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with subterete filaments and versatile, globose anthers with confluent thecae; outer whorl of five with flattened filaments and basifixed, obloid, 2-celled anthers; filaments ± equal in length, overlapping, free. *Pod* obliquely shallowly obtriangular with an acuminate apex and long, pungent beak, 17–20 × 8–11 mm, rather thick-walled; upper suture almost straight; lower suture acute to 90° and strongly falciform. *Seed* not seen. (Fig. 28).

**Flowering period:**—September and October. *Fruiting period:* From September.

**Distribution:**—Western Australia, eastern wheatbelt, restricted to the Newdegate–Lake King area.

**Habitat:**—Grows in pale sand or sandy loam over lateritic gravel on low ridges in a gently undulating landscape mostly cleared for agriculture. Vegetation is open mallee-heath (kwongan) dominated by *Eucalyptus pleurocarpa* Schauer (1844: 132) or kwongan (heath) and species of *Acacia*, *Allocasuarina*, *Banksia*, *Callitris*, *Hakea*, *Gastrolobium*, *Grevillea*, *Leptospermum* J.R.Forster & J.G.Forster (1775: 71), *Melaleuca*, *Santalum* Linnaeus (1753: 349) and *Verticordia*.

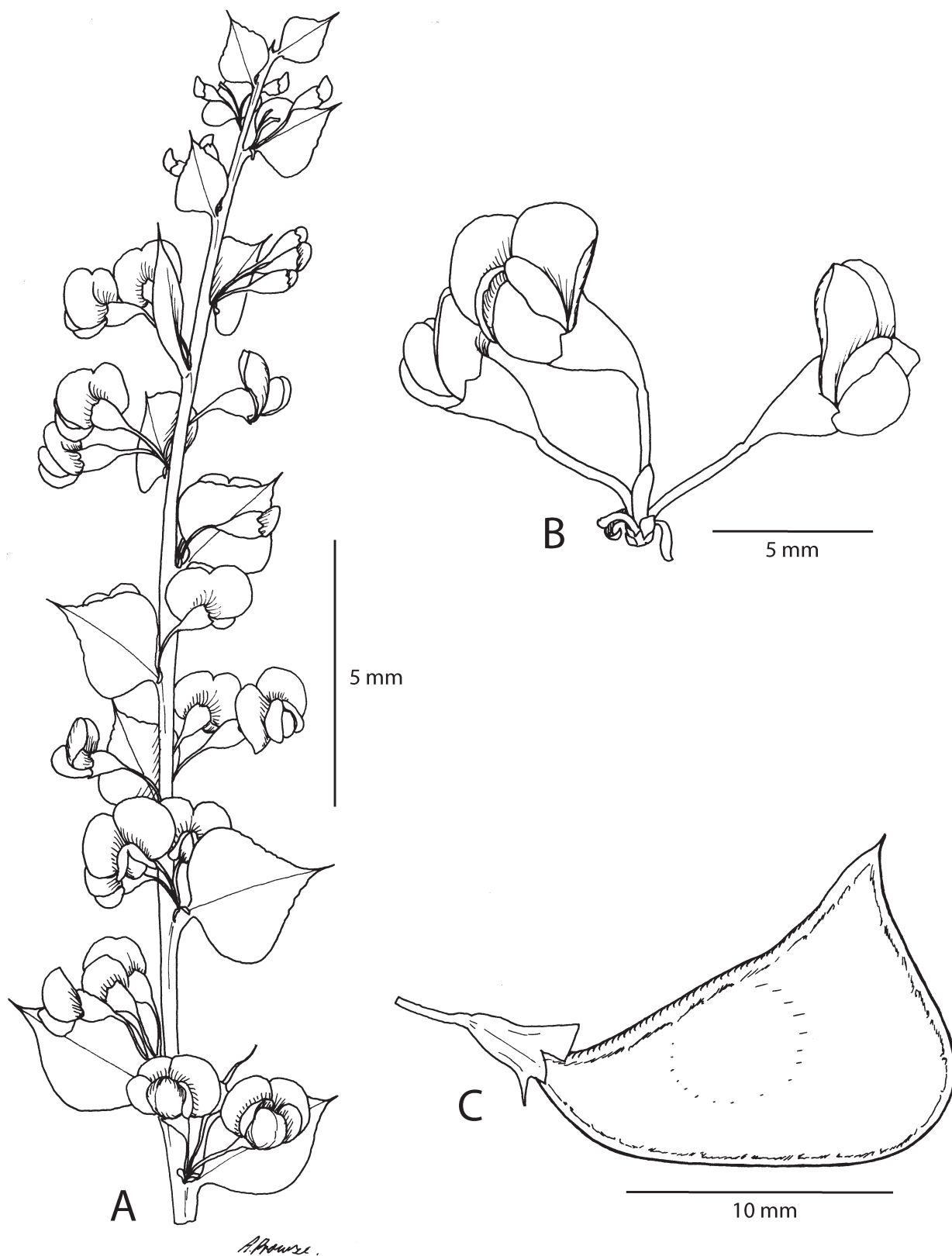
**Conservation status:**—National: Not listed. WA: Priority 2, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (8 examined):**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA.** **Roe:** Newdegate to Lake King, 33°10'S, 119°10'E, *M.D. Crisp 8522 & W. Keys*, 28 September 1993 (CANB, K, MEL, PERTH); *ibid.*, *R.J. Hnatiuk 830072*, 1 October 1983 (CANB); *ibid.*, *K.R. Newbey 10873*, 23 January 1985 (CANB, PERTH); *ibid.*, 33°10'S, 119°20'E, *J.D. Briggs 1651 & L. Silvester*, 24 September 1984 (CANB, PERTH); *ibid.*, *J. Taylor 2305 & P. Ollerenshaw*, 26 September 1983 (CBG, PERTH); Newdegate–Lake King area, 33°S, 119°20'E, *J.D. Briggs 1653 & L. Silvester*, 24 September 1984 (CANB, NSW, PERTH); *ibid.*, *S. Patrick s.n.*, 29 August 1986 (PERTH 2573113).

**Affinity:**—*Daviesia lineata* shows a close superficial resemblance to three other species with erect, terete phyllodes, viz. *D. apiculata*, *D. oxylobium* and *D. teretifolia*. None of these has phyllodes < 1 mm in diameter, nor with such fine striations as seen in *D. lineata*. Their inflorescences are more than 2-flowered and their keel petals are falcate and much narrower than in *D. lineata*. *Daviesia teretifolia* is generally < 1 m tall, has glaucous phyllodes with a distinctly acicular apex and has longer pedicels (mostly 8–15 mm long) than *D. lineata*. *Daviesia oxylobium* differs in having acicular apices to the phyllodes, and flowers about half the size of those of *D. lineata* (e.g. standard 4–4.5 × 5.5–6 mm). In *D. apiculata*, the phyllodes are apiculate and only semi-pungent, their colour is grey-green and the flowers are about half the size of those of *D. lineata* (e.g. standard 4–4.5 × 5 mm).

## VI.b. Umbel Clade

**28. *Daviesia rhombifolia*** Meisner (1844: 56), Bentham (1864: 79), Crisp (1987a: 253) Crisp (1995: 1230), Wheeler *et al.* (2002: 744). Type: 'In arenosis sylvae districtus Sussex, d. 17. Dec. 1839, fructifera Herb. Preiss. No. 1145. et in glareosis prope fontem Ronau'swell (Darling's-range) d. 25. April 1840. No. 1146. (Drummond n. 224.)' Lectotype (Crisp 1995: 1230): *Drummond 224* (BM); isolectotype: G, K (3 sheets), MEL, OXF, P (2 sheets), W (2 sheets). Syntype: *Preiss 1145* (LD, NY); isosyntype: G (2 sheets), MEL (2 sheets), MO, P, W. Syntype: *Preiss 1146* (LD, NY)



**FIGURE 29.** *Daviesia rhombifolia*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6705*; C from *Helms s.n.*, (NSW 34906). Drawn by A.L. Prowse.

Bushy, spreading *shrubs* to 0.6 m high, glabrous or hirsute to scabrous on branchlets and phyllodes, glaucous or dull green. *Root anatomy* normal (unistelar). *Branchlets* terete, ribbed, hirsute or not. *Phyllodes* scattered,

spreading, rhombic to transversely so, often undulate, apically acuminate and pungent, distal margins usually crenulate, basally cuneate to truncate and constricted to a short pseudo-petiole, with a thickened articulation at branchlet, 8–30(–35) × 5–25(–35) mm, occasionally scabrous, venation raised, reticulate. *Unit inflorescences* 1 or 2 per axil, fasciculate, 3(4)-flowered; *peduncles* 0–0.5 mm long; all *bracts* forming an involucre at the base of the inflorescence, spreading, recurved, oblong, sometimes slightly keeled, ca. 1 mm long. *Pedicels* 3–6 mm long. *Calyx* 3–4.5 mm long including the 1–1.5 mm receptacle, 10-ribbed; upper 2 lobes fully fused into ± trilobed, acute lip ca. 1.5 mm long; lower 3 lobes triangular, ca. 0.5 mm long, usually with a callus at the base of each sinus. *Corolla: standard* transversely broadly elliptic, emarginate, 5–6 × 5.5–6.5 mm including the 1–1.5 mm claw, with 2 thickened calli at the base of the lamina, orange infused with dark red towards the centre surrounding a barely visible central yellow stripe; *wings* obovate, auriculate, 4–5.5 × 2–2.5 mm including the 1–2.5 mm claw, orange to red; *keel* half transversely elliptic, obtuse, auriculate, saccate, broadly rounded along abaxial margin, 4–5.5 × 2–2.5 mm including the 1–1.5 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with slightly longer, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with broader, shorter, compressed filaments that become broader towards the apex and longer, slender, basifixed, 2-celled anthers; vexillary stamen with a slender filament that broadens slightly towards the apex and has a smaller anther than the rest; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, curved briefly and sharply downwards on the lower suture at the base, coriaceous, 12–15 × 9–11 mm; upper suture up-curved to the beak; lower suture broadly rounded but forming an acute angle. *Seed* not seen. (Fig. 29).

**Flowering period:**—July to September. *Fruiting period:* September and October.

**Distribution:**—Western Australia, rather scattered from Perth to the far south-west and east to Merredin, Lake King and Munglinup.

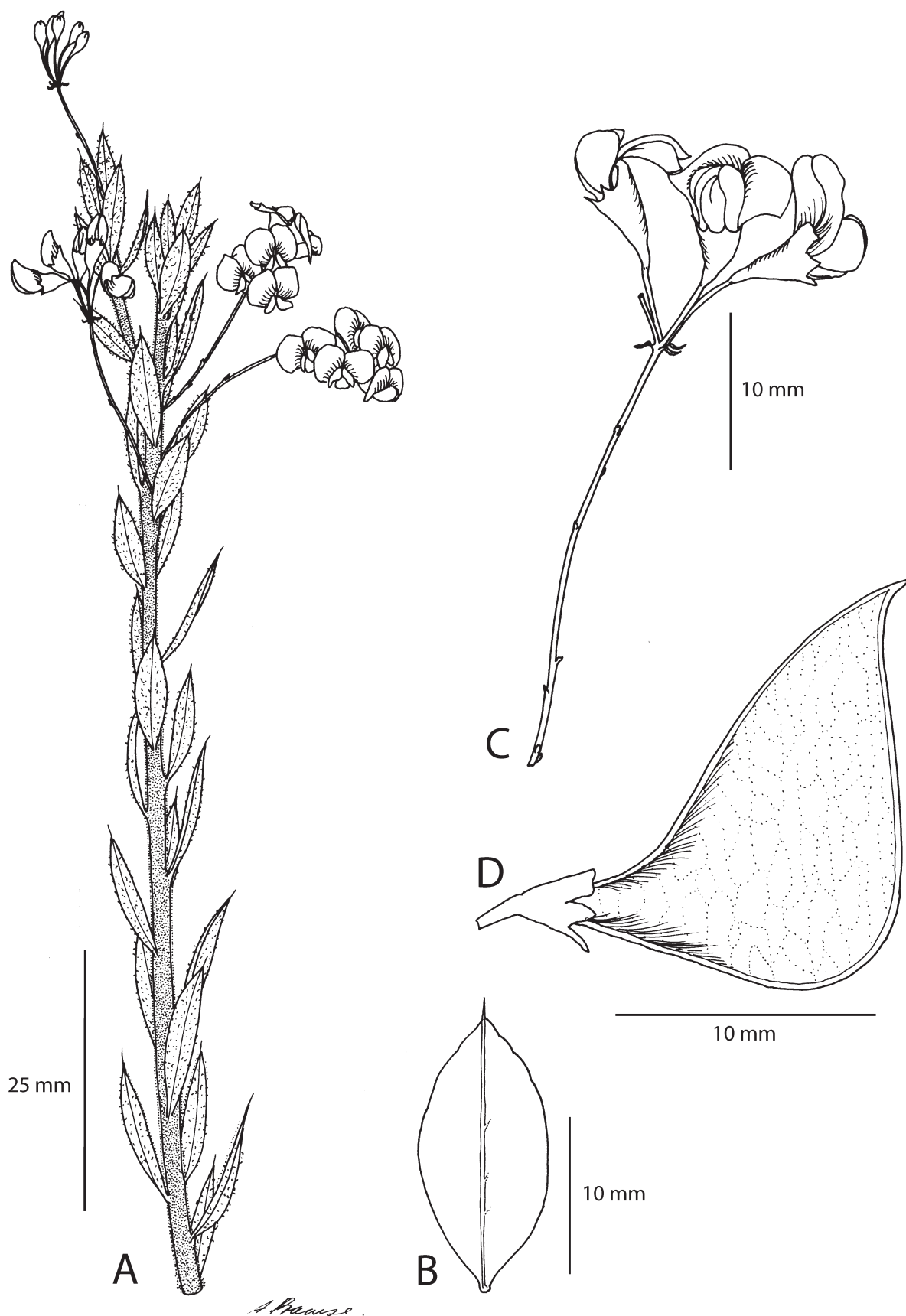
**Habitat:**—Grows in white to gravelly sand, gravelly lateritic clay or gravel in open forest dominated by *Eucalyptus marginata* and *E. calophylla*, or in kwongan heathland.

**Selected specimens (48 examined):**—**WESTERN AUSTRALIA. Coolgardie:** Carrabin, between Merredin and Southern Cross, 31°22'S, 118°40'E, *W.E. Blackall 4034*, 22 August 1939 (PERTH). Darling: Gooseberry Hill, Darling Range, 31°57'S, 116°03'E, *A. Morrison s.n.*, 18 August 1903 (AD 96344237, CANB 336554); *ibid.*, *M.D. Crisp 6705*, 24 July 1980 (AD, CBG, NSW, US); *ibid.*, *R. Helms s.n.*, 11 October 1899 (NSW 34906). **Roë:** 17 km E from Newdegate towards Lake King, 33°06'S, 119°12'E, *C.E. & D.T. Woolcock D263*, 12 August 1982 (AD, CBG, MEL, PERTH).

**Affinity:**—*Daviesia rhombifolia* differs from all its congeners in the rhombic shape of the phyllodes and the distinctive pods. This species shows some geographic variation, with some specimens from the wheatbelt being hirsute with narrower phyllodes than in the typical, more westerly populations.

**29. *Daviesia pedunculata*** Benth. in Lindley (1839: xiv), Bentham (1864: 74), Crisp (1987a: 252), Crisp (1995: 1220). Type: Swan River, *Drummond*, 1839. Holotype: K; isotypes: BM, CGE

Spreading or erect *shrubs*, 0.3–0.6 m high, glabrous to grey-tomentose on branchlets. *Root anatomy* normal (unistelar). *Branchlets* terete, ribbed. *Phyllodes* erect, ovate or elliptic (to narrowly so) or occasionally linear or broad, apically acuminate and usually pungent, marginally undulate and often irregularly shallowly crenulate in the upper half, basally tapered or contracted to a short (1–2 mm) pseudo-petiole, with a thickened articulation at branchlet, (7–)10–28(–37) × 2–11(–16) mm, glabrous or nearly so; lower phyllodes tending to be broad, obovate, crenulate and non-pungent, or even emarginate (e.g. *Evans WE 801*, *Lally 1360*). *Unit inflorescences* 1(2) per axil, condensed racemes or umbels, 3–8-flowered, occasionally terminal (*Lally 1360*); *peduncle* 12–25(–75) mm; *rachis* 0–5 mm long; *subtending bracts* oblong to triangular, keeled, spreading at the tips, ca. 1–2 mm long; *barren bracts* oblong to rounded-triangular, occasionally leaf-like (*Evans WE 801*, *Lally 1360*), ca. 0.5–1 mm long. *Pedicels* 2.5–10 mm long, often shiny and slightly viscid, sometimes with a flange at the apex. *Calyx* 5–6 mm long including the 1–1.5 mm receptacle; upper 2 lobes united in a broad, truncate lip that may be emarginate, keeled, 2–2.5 mm long; lower 3 lobes triangular, with small calli at the base of each sinus, 1–2.5 mm long. *Corolla: standard* depressed- or very broad-ovate, emarginate, 7.5–10 × 7–11 mm including the 1.5–2 mm claw, usually with 2 thickened calli at the base of the lamina, yellow with a large circular maroon patch around a central yellow stripe; *wings* obovate to elliptic with a rounded, incurved apex enclosing the keel, deeply auriculate, saccate, 7–7.5 × 3–4 mm including the 1.5–2.5 mm claw, maroon; *keel* half transversely elliptic to ovate, acute, saccate, 6–7 × 2–2.5 mm including the 1.5–2.5 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete



**FIGURE 30.** *Daviesia pedunculata*. A. Flowering branchlet. B. Broader, glabrous phyllode. C. Inflorescence. D. Pod. A from Chapman (85)77; B, C from Crisp 6210; D from Chapman (111)77. Drawn by A.L. Prouse.

filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and round, 2-celled, basifixed anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, ± compressed, 15–18 × 7–9.5 mm; upper suture slightly sigmoid; lower suture scarcely acute to scarcely obtuse. *Seed* compressed longitudinally, ca. 5 mm long, ca. 3 mm wide, ca. 1.6 mm thick; *aril* ca. 1.2 mm long. (Fig. 30).

**Flowering period:**—July to December (in the south). *Fruiting period:* From October.

**Distribution:**—Western Australia, in three disjunct areas near Kalbarri, around Eneabba and near Perth. An outlying record from ‘Oldfield River’, on the south coast towards Esperance, requires verification.

**Habitat:**—Grows on sandy or clay-sand soils in heathland.

**Selected specimens (40 examined):**—WESTERN AUSTRALIA. **Irwin:** 16 km N of Hill River bridge along Brand Highway, 30°15’S, 115°26’E, *M.D. Crisp 6210*, *J. Taylor & R. Jackson*, 29 September 1979 (CBG, NSW, PERTH); 32 km W of Arrino, 29°26’S, 115°25’E, *C. Chapman (29)76*, 31 July 1976 (AD, CBG, K, MEL, PERTH); 41 km W of Winchester on road to Eneabba, 29°50’S, 115°31’E, *C. Chapman (111)77*, 23 October 1977 (CBG, MEL, PERTH); [4.5 km] N of Coorow to Green Head road, on Willis Road, 29°52’S, 116°01’E, *C. Chapman (85)77*, 18 September 1977 (CBG, PERTH); Badgingarra National Park, south of Cadda Road, 30°20’S, 115°20’E, *N.F. Norris 971*, 26 September 1982 (CANB, HO, MEL); 47 km SE of Kalbarri on Binu Road West, ca. 4 km W of Yerina Springs road, 28°01’S, 114°17’E, *T.R. Lally 640*, 3 August 1995 (CANB, HO, PERTH); Lesueur National Park, western boundary of Vic. Loc. 10641, ca. 500 m S of northern boundary of Lesueur National Park, 30°06’S, 115°13’E, *B. Evans WE 801*, 24 December 1993 (PERTH); same area, 30°05’S, 115°13’E, *T.R. Lally & B.J. Lepschi TRL 1360*, 7 December 1996 (CANB, PERTH). **Darling:** Near Midland Junction, 31°53’S, 116°00’E, *C.R.P. Andrews s.n.*, October 1902 (PERTH 5475635).

**Affinity:**—*Daviesia pedunculata* is similar to *D. lancifolia* and *D. mollis*. *Daviesia lancifolia* has elliptic to obovate phyllodes which tend to have a truncate apex, the flowers are smaller (e.g. calyx 3–4 mm long, standard 6–7 mm long) and the pods are smaller (8–9 mm long). *Daviesia mollis* has broadly obovate or orbicular phyllodes that are often much broader (up to 15 mm broad) than in *D. pedunculata*; *D. mollis* also differs in having phyllodes conspicuously and softly hirsute, and smaller pods (10–11 mm long).

**30. *Daviesia audax*** Crisp (1995: 1175). Type: Western Australia, Roe, 0.5 km E of Harrismith, 32°56’S, 117°52’E, *M.D. Crisp 6155*, *J. Taylor & R. Jackson*, 26 September 1979. Holotype: CBG; isotypes: K, MEL, MO, NSW, PERTH

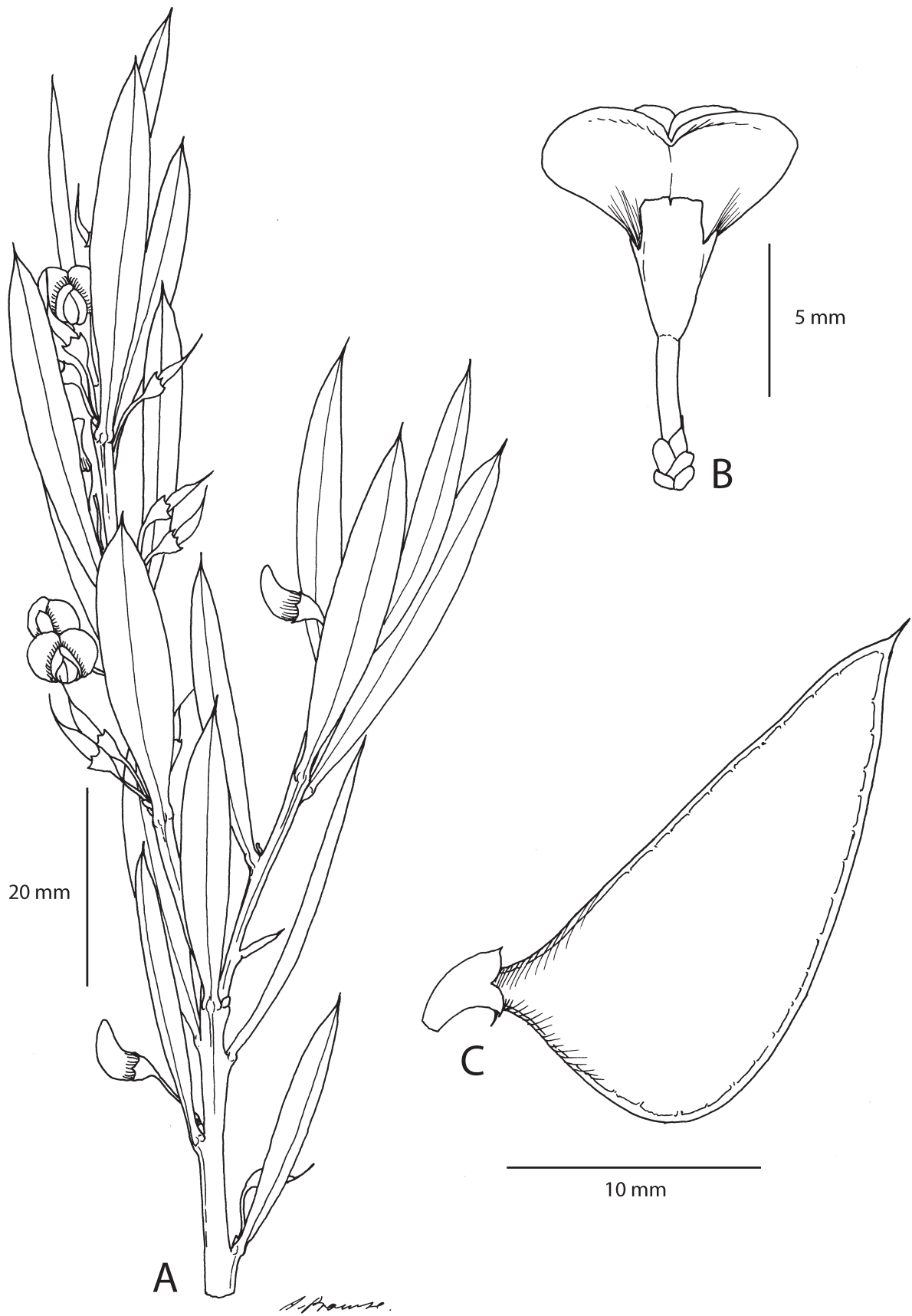
Erect, usually single-stemmed *shrubs* or small trees, to 2 m high, glabrous, glaucescent to glaucous. *Root anatomy* unknown. *Branchlets* ascending, angular. *Phyllodes* scattered, erect, narrowly elliptic to narrowly obovate, thick, rigid, apically acuminate and pungent, gently narrowed to the base, with a thickened articulation at branchlet, (20) 25–65 × 5–10(–14) mm, venation obscure except midrib. *Unit inflorescences* 1–3 per axil, reduced to 1 flower each (with a cluster of bracts at the base of each pedicel); *peduncle* nil; *bracts* appressed, oblong, ca. 1 mm long. *Pedicels* 2–4 mm long. *Calyx* 4–4.5 mm long including the 1–1.5 mm receptacle, lightly ribbed; upper 2 lobes united in a truncate lip with recurved lobes, ca. 1–1.2 mm long; lower 3 lobes triangular, ca. 0.8 mm long. *Corolla:* orange with red markings; *standard* transversely broadly elliptic to transversely elliptic, emarginate, 5–7 × 5.5–8 mm including the ca. 1.5 mm claw, with 2 calli at the base of the lamina; *wings* broadly elliptic, apically rounded, incurved and overlapping to enclose the keel, deeply auriculate, 5–6 × 2–3 mm including the ca. 2 mm claw; *keel* half transversely elliptic, beaked, auriculate, saccate, 5–7 × 2.5 mm including the ca. 2 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, narrower, 2-celled, basifixed anthers; filaments free. *Pod* obliquely obtriangular, acuminate, compressed but thick-walled, 18–25 × 10–12 mm; upper suture almost straight to slightly sigmoid; lower suture scarcely acute to scarcely obtuse. *Seed* obloid, 7.5–8 mm long, ca. 4.5 mm broad, ca. 3 mm thick, light or orange brown with black mottling; *aril* 2.5–3 mm long. (Fig. 31).

**Flowering period:**—August to October. *Fruiting period:* November.

**Distribution:**—Western Australia, southern wheatbelt, extending in a narrow band from Harrismith to east of Lake King.

**Habitat:**—Well-drained, light grey sand to light sand over laterite to gravelly laterite, in heathland dominated by tall *Grevillea*.





**FIGURE 31.** *Daviesia audax*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A, B from *Crisp 6155*; C from *Crisp 5527*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Selected specimens (17 examined):—WESTERN AUSTRALIA. Avon:** Harrismith, 0.5 km E of town, 32°56'S, 117°54'E, *M.D. Crisp* 5527, 28 January 1979 (CBG). **Roe:** 10 km NE of Kukerin along road to Tarin Rock, 33°09'S, 118°08'E, *M.D. Crisp* 5535, 28 January 1979 (CBG); 14.5 km from Lake King towards Newdegate, 33°06'S, 119°32'E, *J.W. Wrigley* 5529, 6 November 1968 (CBG, PERTH); 11 km W of Lake King towards Perth, 33°06'S, 118°34'E, *F. Lullfitz* 5550, 8 October 1966 (PERTH); 27 km E of Lake Grace, 33°06'S, 118°12'E, *A.S. George* 5681, 30 August 1963 (PERTH).

**Affinity:**—This species presents a strong superficial resemblance to *D. daphnoides*, which has similarly shaped, rigid, erect, pungent phyllodes. However, the latter differs in having conspicuous lateral venation, 2–4-flowered racemes with a distinct rachis and pods turgid at the base. *Daviesia audax* is probably related to *D. nudiflora*, which has single-flowered unit inflorescences and a similar floral morphology; also, in some forms of *D. nudiflora*, the pungent phyllodes are similar in shape and orientation to those of *D. audax*. Characters distinguishing *D. nudiflora* include the lack of an articulation at the base of the phyllode (except in subsp. *hirtella*, which has hirsute branchlets), thickened phyllode margins, leafless lower parts of the branchlets, or a combination of these features. Also, the phyllodes of *D. nudiflora* are often folded upwards longitudinally, and the pods are always much smaller (10–14 mm long) than in *D. audax*.

**31. *Daviesia lancifolia*** Turczaninow (1853: 263), Crisp (1995: 1206). *Daviesia mollis* Turcz. var. *minor* Bentham (1864: 74)—replacement name for *D. lancifolia* Turcz. Type: 'Drum. IV. n. 28. Holotype: KW; isotypes: BM (2 sheets), FI-W, G (2 sheets), K (2 sheets), MEL, W

*Daviesia pedunculata* Benth. in Lindley (1839: xiv) [var.] *b minor* Meisner (1844: 53). Type: 'In glareosis sterilibus ad radices collium Konkoberuphills (Kent) d. 21. Nov. 1840. Herb. Preiss. no. 1154.' Lectotype (Crisp 1995: 1206): LD; isoelectotype: G (2 sheets), NY.

Prostrate to spreading-erect *shrubs*, to 0.5 m high and to 1 m broad, scabrous to occasionally glabrous and ± glaucous on vegetative parts. *Root anatomy* normal (unistelar). *Branchlets* terete, lightly ribbed. *Phyllodes* scattered, erect, mostly elliptic to obovate (to narrowly or broadly so), occasionally cuneate, ovate, orbicular or linear, apically truncate to acuminate, with the tip varying from pungent to mucronate (less rigid), marginally ± irregularly crenulate in the upper half, basally cuneate and constricted to a short pseudo-petiole, articulate at branchlet, 7–17(–20) × 2–11 mm. *Unit inflorescences* 1 or 2 per axil, umbellate or condensed racemes, 3–5-flowered; *peduncle* 9–31 mm long; *rachis* from almost nil to 4 mm long; *subtending bracts* oblong to narrowly triangular, keeled, spreading at the tips, 0.5–2 mm long; *barren bracts* oblong, keeled, ca. 1 mm long. *Pedicels* 3–7 mm long, somewhat viscid, thickened towards the apex, which is flanged. *Calyx* 3–4 mm long including the ca. 1 mm receptacle, all lobes having recurved tips; upper 2 lobes united in a truncate, emarginate lip, 2–2.5 mm long; lower 3 lobes narrowly triangular, ca. 2 mm long. *Corolla: standard* broadly ovate, emarginate, 6–7 × 6–6.5 mm including the 1–1.5 mm claw, with 2 small calli at the base of the lamina, yellow to pale orange with a thin (often faint) red ring surrounding the yellow centre; *wings* obovate with a rounded apex, auriculate, 6–7 × 2–2.5 mm including the 1–1.5 mm claw, yellow to red; *keel* half transversely ovate, acute, supervolute, auriculate, saccate, 5.5–7.5 × 1.5–2 mm including the ca. 1.5 mm claw, yellow to red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender terete filaments and shorter, round, confluent, subbasifixed anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, 2-celled, basifixed anthers; filaments free. *Pod* obliquely shallowly-obtriangular with an acute or attenuate apex, 8–9 × 5–6 mm; upper suture strongly sigmoid; lower suture obtuse. *Seed* not seen. (Fig. 32).

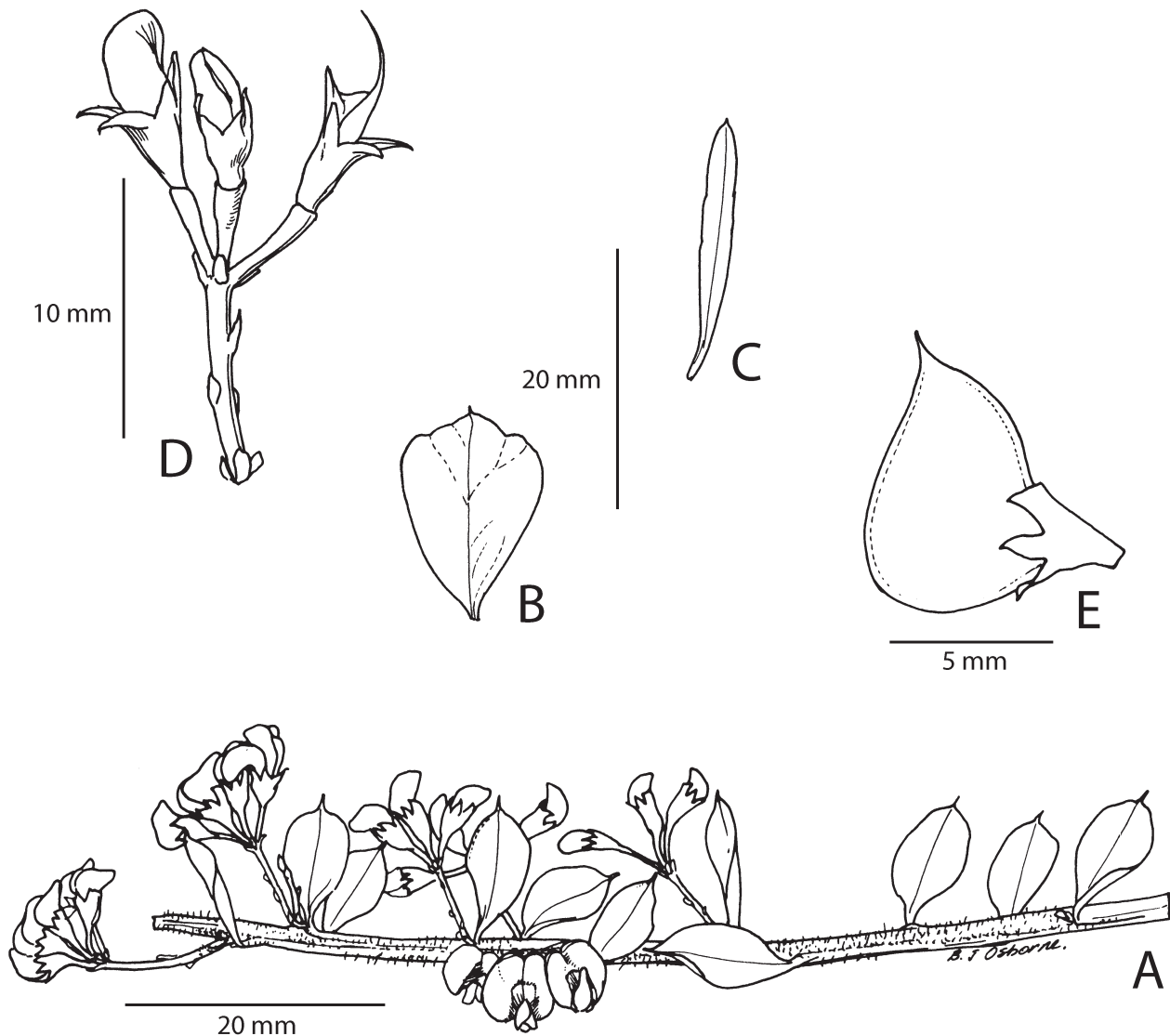
**Flowering period:**—October to March. *Fruiting period:* One specimen fruiting in January seen.

**Distribution:**—Western Australia, southern wheatbelt and south coast, from Narrogin and the Stirling Range east to the Hyden area and Mt Ragged.

**Habitat:**—Grows on sand, gravel, sandy clay, lateritic clay or rocky soils, in heath or mallee-shrublands.

**Selected specimens (39 examined):—WESTERN AUSTRALIA. Roe:** 7 km W of Ravensthorpe–Lake King road, 20 km S of Lake King, 33°16'S, 119°41'E, *M.D. Crisp* 4997, 10 January 1979 (CBG, MEL, PERTH); by Ravensthorpe–Lake King road, 29 km NW of Ravensthorpe, 33°21'S, 119°52'E, *M.D. Crisp* 1003, 9 August 1975 (CBG). **Eyre:** 1 km NW of Mt Melville, near Cape Riche, 34°35'S, 118°44'E, *M.D. Crisp* 5107, 14 January 1979 (CBG); 25 km from Ravensthorpe along Lake King road, 33°25'S, 119°56'E, *M.D. Crisp* 4987, 10 January 1979 (AD, CBG, K, MEL, PERTH); 35 km SE of Lake King, 4 km NE along Hayes Road from Ravensthorpe–Lake

King road, 33°23'S, 119°56'E, *M.D. Crisp 4989*, 10 January 1979 (CBG); Albany, 35°00'S, 117°52'E, *W.E. Blackall s.n.*, January 1938 (PERTH 5189403); Pullitup Swamp ca. 10 km NNE of Bremer Bay, 34°21'S, 119°25'E, *T.A. Halliday 302*, 15 December 1974 (AK, PERTH).



**FIGURE 32.** *Daviesia lancifolia*. A. Prostrate flowering branchlet. B, C. Phyllodes showing variation. D. Inflorescence. E. Pod. A from *Crisp 5165*; B from *Crisp 1003*; C from *Crisp 5107*; D from *Crisp 4989*; E from *Crisp 4987*. Drawn by B.-J. Osborne.

**Affinity:**—*Daviesia lancifolia* is similar in appearance to *D. mollis* and *D. pedunculata*. *Daviesia mollis* can be readily distinguished by its phyllodes, which are broadly obovate or orbicular, 5–15 mm broad, pungent, green and conspicuously and softly hirsute. *Daviesia pedunculata* has ovate to elliptic phyllodes, the flowers are larger (e.g. calyx 5–6 mm long, standard 7.5–10 mm long), the standard has a large and conspicuous central maroon patch with a vertical yellow stripe, and the pods are larger (15–18 mm long).

**32. *Daviesia mollis*** Turczaninow (1853: 263), Bentham (1864: 74, partly), Crisp (1995: 1213). Type: ‘Drum. V. n. 39.’ Holotype: KW; isotypes: BM, FI-W, G, K (2 sheets), OXF, P, W

Spreading, intricate *shrubs*, 0.3–1 m high, softly hirsute to rarely hispid on vegetative parts, green beneath the indumentum. *Root anatomy* normal (unistelar). *Branchlets* terete, ribbed. *Phyllodes* scattered, erect, mostly elliptic (to broadly so), occasionally obovate (to broadly so) or orbicular, apically rounded to more rarely truncate, pungent or rigidly mucronate, marginally entire in the lower half and irregularly, shallowly crenulate in the upper half, basally cuneate and constricted to a short pseudo-petiole, inarticulate at branchlet, 9–27 × 7–15 mm. *Seedling phyllodes*

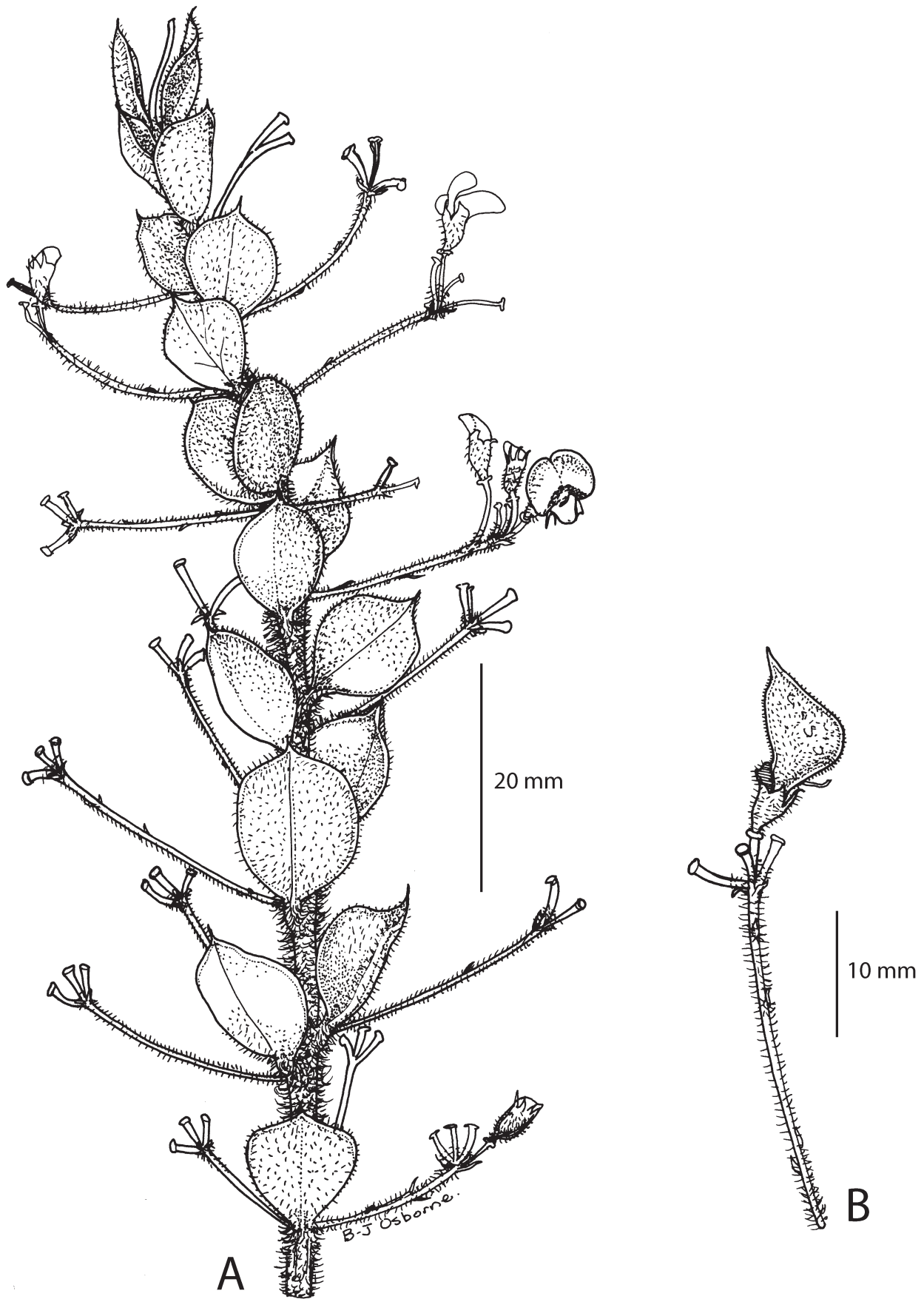


FIGURE 33. *Daviesia mollis*. A. Branchlet late in flowering. B. Infructescence. A, B from *Crisp 4953*. Drawn by B-J. Osborne.

scattered, obovate with a rigid but not pungent apex, cuneate at base, 11–14 × 5–8 mm, sparsely scabrous. *Unit inflorescences* 1 or 2 per axil, umbellate or condensed-racemose, 3–5-flowered; *peduncle* 14–37 mm; *rachis* 0–2 mm; *subtending bracts* oblong to narrowly triangular, keeled, spreading at the tips, 0.5–2 mm long; *barren bracts* oblong, keeled, ca. 1 mm long. *Pedicels* 3–5 mm long, shiny and slightly viscid, thickened towards the apex, which is flanged. *Calyx* 4.5–5.5 mm long including the ca. 1 mm receptacle, hispid; upper 2 lobes united in a broad, truncate, emarginate lip, lobes almost flat with outcurved tips or flat and curving sharply upwards only at the tips and outcurved, ca. 2 mm long; lower 3 lobes triangular with recurved tips, 1–1.5 mm long. *Corolla: standard* broadly ovate, emarginate, 8 × 6.5–7.5 mm including the 1–1.5 mm claw, with a thickened base, yellow with a faint, thin red circle around the yellow basal patch; *wings* obovate with a rounded, slightly incurved apex, auriculate, 7–8 × 3 mm including the 1–2 mm claw, reddish with yellow margins at the tips; *keel* half transversely narrowly ovate, acute and incurved, strongly auriculate, strongly saccate, ca. 7.5–8 × 2 mm including the 2.5 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, narrower, basifixed, 2-celled anthers; filaments free. *Pod* obliquely very shallowly obtriangular, acuminate, 10–11 × 7–8 mm; upper suture strongly sigmoid; lower suture acute but broadly curved. *Seed* ellipsoid to globose, 3.9–4.3 mm long, 2.5–2.7 mm broad, 1.8–2 mm thick; *aril* 2.2–2.3 mm long. (Fig. 33).

**Flowering period:**—September and October. *Fruiting period:* January.

**Distribution:**—Western Australia, Ravensthorpe Range and the hills of Fitzgerald River National Park; also recorded from the Stirling Range.

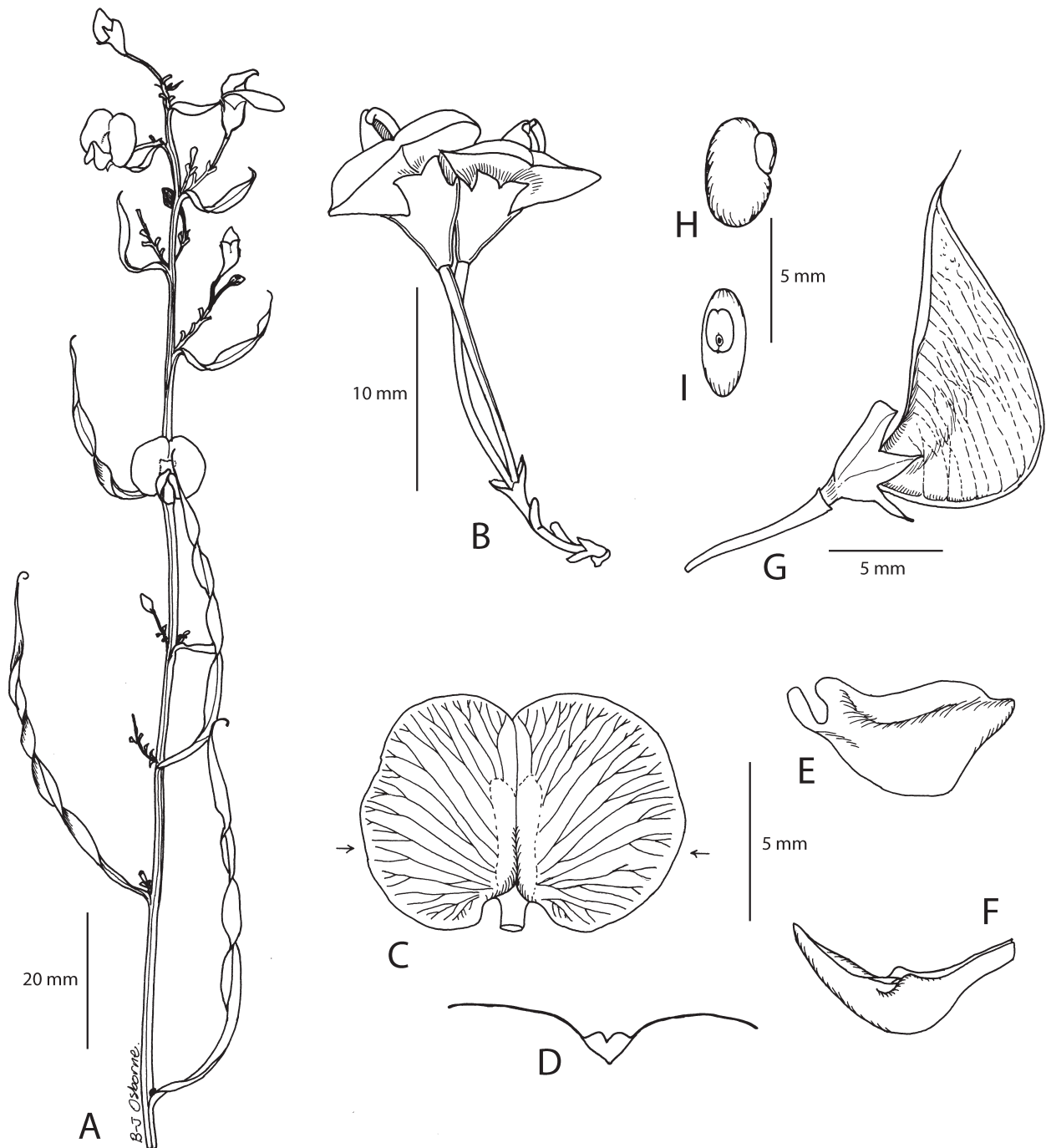
**Habitat:**—Red stony soil in heathland dominated by *Eucalyptus pleurocarpa*.

**Selected specimens (20 examined):**—WESTERN AUSTRALIA. **Eyre:** 11 km ESE of Ravensthorpe, 0.5 km E of Mt Desmond, 33°37'S, 120°09'E, *M.D. Crisp 4953*, 9 January 1979 (CBG, K, PERTH); Middle Mt Barren, 34°03'S, 119°41'E, *C.A. Gardner 9153*, 20 September 1948 (PERTH); 1 km E of Elverdton Mine, 33°37'S, 120°09'E, *K.R. Newbey 944*, 15 September 1963 (PERTH); Fitzgerald River National Park, 10 km SSW of Annie Peak, 33°56'S, 119°57'E, *M.D. Crisp 5035*, 11 January 1979 (CBG, MEL, PERTH).

**Affinity:**—*Daviesia mollis* closely resembles *D. lancifolia* and *D. pedunculata*. The phyllodes of *D. lancifolia* are similar, though generally much narrower (mostly up to 6 mm broad) and rarely orbicular; they also differ in being glaucescent, and glabrous or sparsely hirsute only on the midrib and margins. *Daviesia pedunculata* differs in having ovate to elliptic phyllodes (mostly < 11 mm broad), the standard has a large and conspicuous central maroon patch with a vertical yellow stripe, and the pods are larger (15–18 mm long).

**33. *Daviesia spiralis*** Crisp (1982a: 9), Crisp (1995: 1238). Type [approximate locality data given because the species is rare]: Wongan Hills area, 30°50'S, 116°40'E, 26 January 1979, *M.D. Crisp 5491*, fl., fr., spirit material, photos. Holotype: CBG; isotypes: CANB, K, NSW, PERTH, US

Intricate, rounded *shrubs* to 1.5 m tall and broad, muriculate on branchlets and phyllodes. *Root anatomy* normal (unistelar). *Branchlets* ascending to erect, terete, ribbed. *Phyllodes* scattered, ascending or spreading, linear, twisted in a right-handed spiral, apically attenuate and uncinata, basally inarticulate and decurrent, to 100 × 3 mm, much reduced towards branchlet apex; with a central and 2 marginal ribs but no visible veins; *stipules* minute, ≤ 0.5 mm long. *Unit inflorescences* 1–few per axil, flowers solitary or an umbel of 2; *peduncle* 2–8 mm long; *subtending bracts* oblong to obovate, keeled, spreading at the tips, 1–1.5 mm long, some tips fimbriate. *Pedicels* 5–18 mm long, viscid, narrowly clavate with an apical flange. *Calyx* campanulate, 4–4.5 mm long; upper 2 lobes united in a truncate emarginate lip; lower 3 lobes triangular, 1.5 mm long. *Corolla: standard* transversely broadly elliptic, emarginate, slightly cordate, 6.5–7.5 × 8–10 mm including the ca. 1 mm claw, with 2 calli at the base of the lamina, yellow, with a rich yellow central oblong or bilobed marking, bordered with a dark red infusion; *wings* irregularly obovate, shortly beaked, auriculate, saccate (to shallowly so), 7–7.5 × 3–3.5 including the ca. 1.5 mm claw, reddish; *keel* subulate, inflexed, supervolute in the upper half, very acutely beaked, slightly auriculate, deeply saccate, 7.5–9 × 2–3 mm including the ca. 1.5 mm claw, reddish grading to maroon at the apex. *Stamens* weakly dimorphic; inner whorl of 5 with longer, terete, slightly narrower filaments; outer whorl of 5 with shorter, broader, compressed filaments; filaments free; anthers all basifixed, ovoid, 2-celled, sometimes beaked at the apex. *Ovary* sessile, narrowly oblong; *style* inflexed. *Pod* obliquely shallowly obtriangular, long-acute, compressed, 10–13 × 4.5–5 mm. *Seed* compressed, ovoid-elliptic, 3–4 mm long, 2–2.5 mm wide, 1.7–2 mm thick, pale brown speckled with black; *aril* conspicuous, ca. 1.5 mm long. (Fig. 34).



**FIGURE 34.** *Daviesia spiralis*. A. Flowering branchlet. B. Inflorescence. C. Standard, adaxial view. D. Same, showing calli in transection (indicated by arrows in C), adaxial face upward. E. Wing. F. Keel. G. Pod. H, I. Seed in lateral and hilar view respectively. A from *Kenneally 2303*; B–I from *Crisp 5491* (holotype). Drawn by B-J. Osborne and M.D. Crisp.

**Flowering period:**—September to January. *Fruiting period:* December to February.

**Distribution:**—Western Australia, north-central wheatbelt, endemic to the Wongan Hills area.

**Habitat:**—*Daviesia spiralis* appears to grow exclusively in laterite-derived clay and gravel. It is associated with mallee-shrubland dominated by various eucalypts and *Allocasuarina campestris* (Diels 1904: 126) Johnson (1982: 74), with *Banksia* species common. However, like many species of *Daviesia*, it tends to be most numerous in disturbed sites. At the type locality, it is associated with the type population of *D. debilior* subsp. *sinuans*.

**Conservation status:**—National: Not listed. WA: Priority 4, adequately known and near-threatened or not threatened, requiring regular monitoring.

**Selected specimens (8 examined):**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Avon:** Wongan Hills area, 30°50'S, 116°40'E, *B.H. Smith* 268, 29 August 1983 (CBG, MEL, PERTH); *ibid.*, *K.F. Kenneally* 2303, 21 September 1974 (PERTH); *ibid.*, *K.F. Kenneally* 7155, 12 December 1979 (PERTH, CANB); *ibid.*, *M.D. Crisp* 9024 & *W. Keys*, 26 October 1996 (AD, CBG, K, PERTH).

**Affinity:**—This species has distinctive spirally twisted phyllodes, which makes it difficult to confuse with any other species of *Daviesia*, except perhaps *D. implexa*. However, in *D. implexa* the phyllodes are loosely twisted through 1–3 turns, whereas the phyllodes of *D. spiralis* form a corkscrew shape, with many turns. Additionally, the phyllodes of *D. implexa* are pruinose and smooth, the pedicels are neither viscid nor flanged at the apex, the standard lacks calli, and the bracts are appressed, subulate and not fimbriate.

**34. *Daviesia uniflora*** Herbert (1922: 37), Crisp (1995: 1244). Type: 'Locality-Yoting, in sand plain. Collectors—Herbert & Wilson No. 174. Date—November, 1920.' Lectotype (Crisp 1995: 1244): PERTH; isolectotype: MEL 80533

Spreading or decumbent *shrubs* to 0.7 m high × 4 m broad, densely hispid on branchlets, hispidulous on margins and midribs of phyllodes, rarely also on the surface. *Root anatomy* normal (unistelar). *Branchlets* terete, obscurely ribbed. *Phyllodes* crowded and overlapping, appressed or steeply ascending, (narrow-) obovate with a cuspidate, pungent, recurved to reflexed apex, tapered or contracted to a short pseudo-petiole, inarticulate with branchlet, 7–13 × 3–8 mm; abaxial midrib prominent, venation obscure. *Unit inflorescences* solitary in the axils, 1-flowered; *peduncle* 8–12 mm long, glabrous to hispidulous, usually viscid, rarely flexuose (e.g. *Crisp* 9362); *subtending bracts* narrowly oblong to linear-canaliculate, ca. 1–1.5(–3) mm long; *barren bracts* several along peduncle. *Pedicels* glabrous, 4–8 mm long, viscid. *Calyx* 5–6 mm including the ca. 1.5 mm receptacle; upper 2 lobes united in a truncate lip with recurved lobes, ca. 1–1.5 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* broadly ovate with a rounded, apiculate apex, 10–15 × 10–14 mm including the 2–3 mm claw, pale yellow with a purplish infusion towards the central rich yellow marking; *wings* obliquely elliptic with rounded, slightly incurved apices that partially enclose the keel, strongly auriculate, 9–12 × 4–5 mm including the 3–4 mm claw, purple; *keel* half transversely narrowly ovate, acute, auriculate, saccate, 13–15 × 2–3 mm including the 6–7 mm claw, purple. *Stamens* strongly dimorphic: inner whorl of 5 with much longer, slender, terete filaments and shorter, rounder, versatile anthers with confluent thecae; outer whorl of 5 with much shorter, broader, compressed filaments and longer, slender, basifixed, 2-celled anthers; filaments free. *Pod* oblique, broadly to very broadly obtriangular, acuminate, somewhat turgid, 10–15 × 9–13 mm. *Seed* globoid, 3–4 mm long, 2–3 mm wide, ca. 2 mm thick, light to dark brown; *aril* 1.5–2 mm long. (Fig. 35).

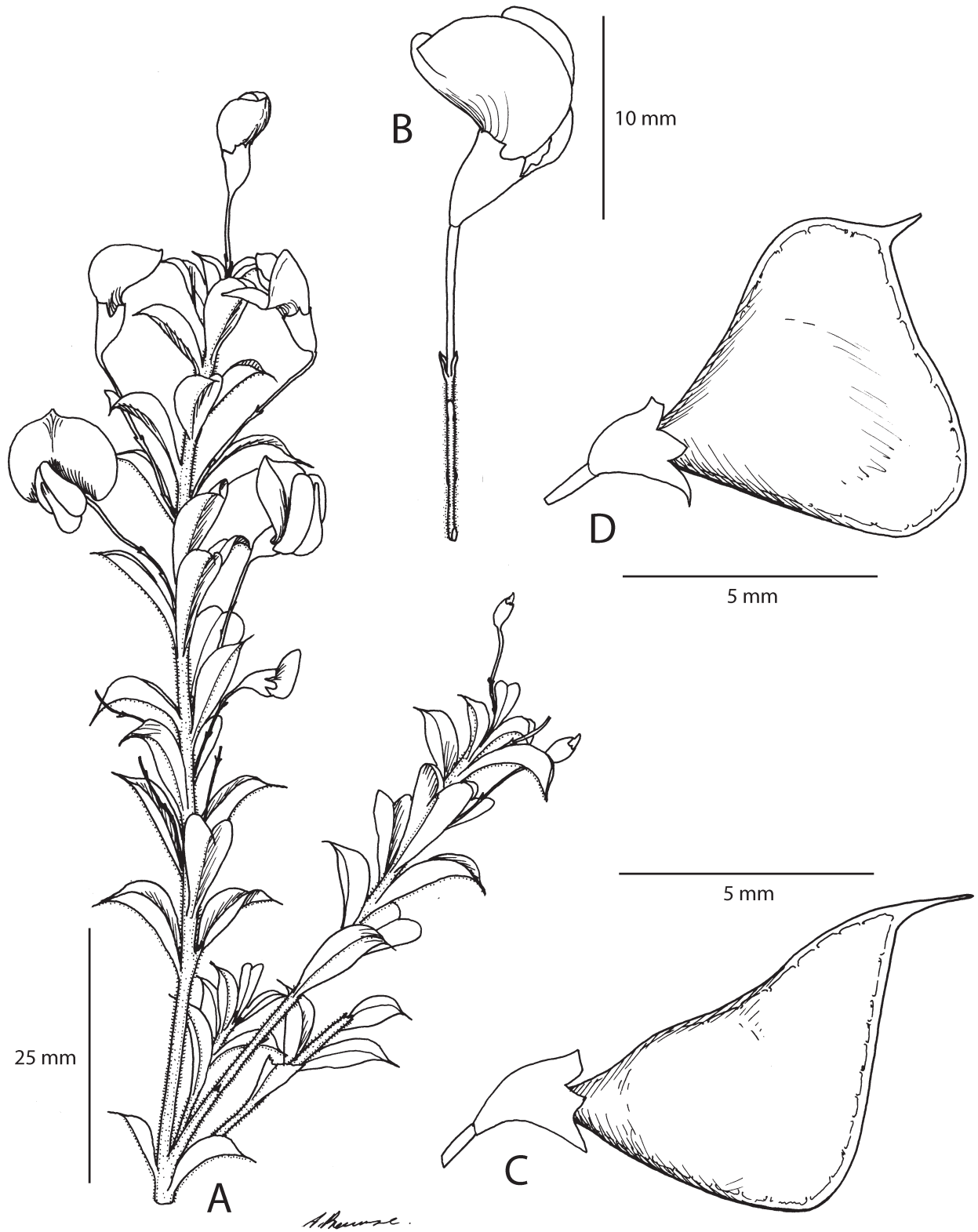
**Flowering period:**—July to November. *Fruiting period:* October and November.

**Distribution:**—Western Australia, south-central wheatbelt, from near Kojonup east to near Ravensthorpe and north to the Great Eastern Highway.

**Habitat:**—Grows in gravelly or loamy sand on sandplains. The vegetation is predominantly kwongan, with *Eucalyptus* and *Allocasuarina* the dominant overstorey genera, and *Banksia* and *Grevillea* common in the understorey.

**Selected specimens (32 examined):**—**WESTERN AUSTRALIA. Roe:** 5 km N of Nyabing, 33°30'S, 118°09'E, *M.D. Crisp* 6143, 26 September 1979 (AD, CBG, PERTH); 21 km W of Lake Grace, 33°06'S, 118°15'E, *W.E. Blackall* 1308, 11 November 1931 (PERTH); 20.5 km E of Newdegate along road to Lake King, 33°05'S, 119°13'E, *M.D. Crisp* 9362, 7 October 2001 (CANB, PERTH). **Avon:** 5 km W of Corrigin, 32°20'S, 117°50'E, *M.D. Crisp* 6171 *et al.*, 26 September 1979 (CBG, NSW, PERTH); 10 km N of Bending, 32°13'S, 118°20'E, *C.A. Gardner* 9448, 18 October 1949 (PERTH).

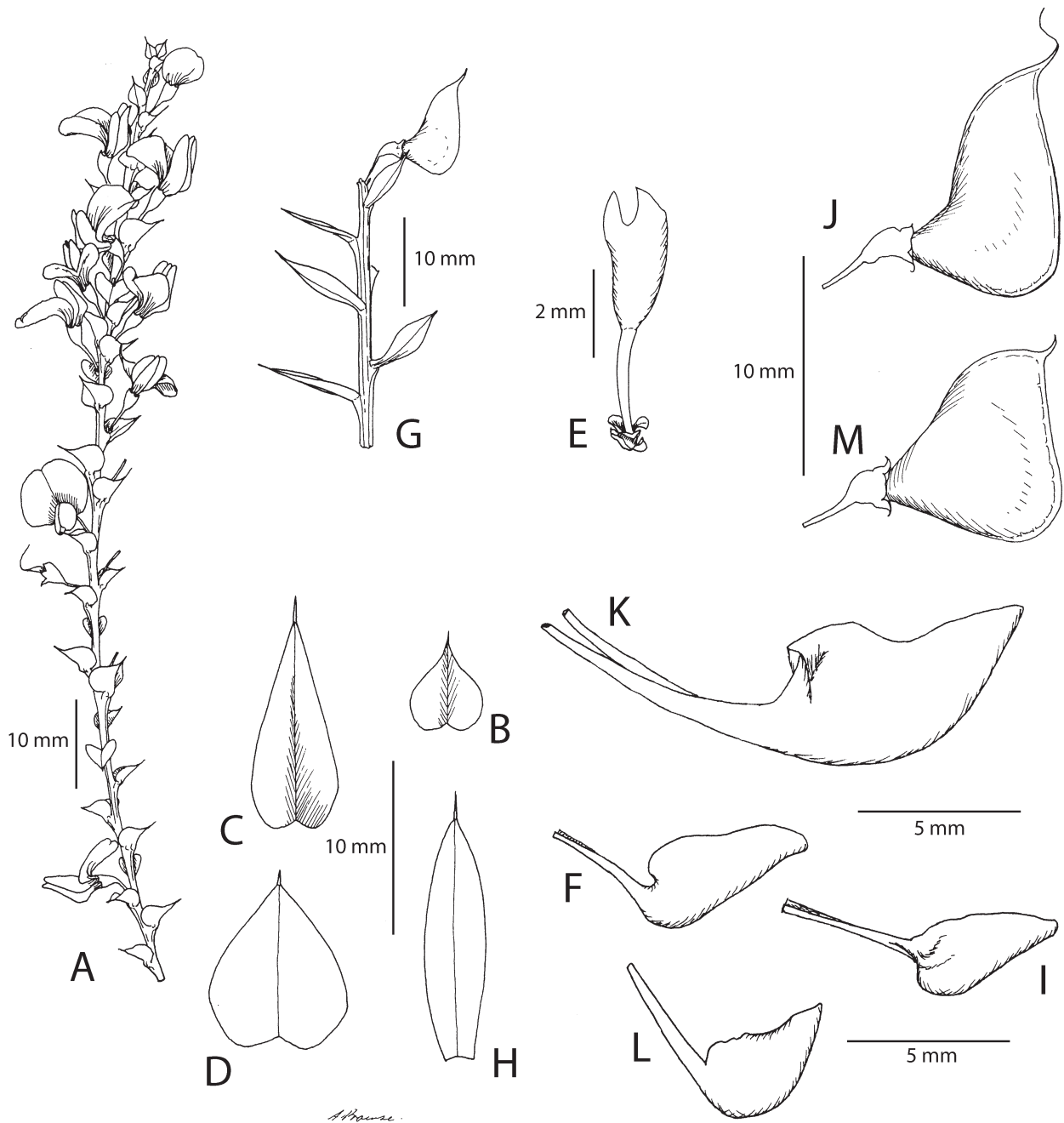
**Affinity:**—In *D. uniflora*, the standard is not emarginate at the apex; rather, it has a small apiculum, which appears to be unique in the genus. *Daviesia cardiophylla* is similar in appearance but is easily distinguished by its emarginate standard, cordate-ovate phyllodes with straight tips, sessile inflorescence (with no peduncle), and a smaller standard (9–10 mm long) with distinct calli at the base.



**FIGURE 35.** *Daviesia uniflora*. A. Flowering branchlet. B. Inflorescence (1-flowered). C, D. Pods, showing variation. A, B from Crisp 6143; C from Blackall 1308; D from Gardner 9448. Drawn by A.L. Prowse.



35. *Daviesia cardiophylla* Mueller (1860: 105), Bentham (1864: 79), Crisp & Chandler (1997: 326), Crisp (1995: 1181). Type: 'In planitiebus sabulosis prope Belgarup, Novae Hollandiae austro-occidentalis. August Oldfield.' Holotype: MEL; isotypes: G, PERTH



**FIGURE 36.** *Daviesia cardiophylla* species group. *Daviesia cardiophylla*. A. Flowering branchlet. B–D. Phyllodes, showing variation. E. Inflorescence (1-flowered) with calyx representing flower. F. Keel. *Daviesia umbonata*. G. Branchlet tip with pod. H. Phyllode. I. Keel. J. Pod. *Daviesia cunderdin*. K. Keel. *Daviesia euryloba*. L. Keel. M. Pod. A, B, E, F from Crisp 6604; C from Crisp 6151; D from Crisp 6507; G, H & J from Crisp 6686 (type); I from Woolcock D13; K from Marchant & Seabrook s.n. (PERTH 3705153); L from Woolcock D74; M from Crisp 6030 (type). Drawing by A.L. Prowse and M.D. Crisp. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Divaricate shrubs 0.5–1.5 m high, muricate to hispid on branchlets and phyllodes. *Root anatomy* normal (unistelar) or with anomalous secondary thickening. *Branchlets* divaricate to ascending, terete, prominently ribbed. *Phyllodes* somewhat crowded, ascending (ca. 0–45°), cordate to occasionally ovate, apically acuminate and pungent, articulate at base, (4–)6–13(–18) × 3–6(–10) mm, concave above but not or scarcely folded upwards longitudinally.

*Seedling phyllodes* ovate, some cordate, 10–12 × 5–8 mm. *Unit inflorescences* solitary or in pairs in the axils, 1-flowered; *peduncle* nil; *subtending bracts* obovate, keeled, spreading at tips, ca. 1 mm long. *Pedicels* 2–8 mm long, ± viscid. *Calyx* with upper 2 lobes united in a truncate emarginate lip, sometimes viscid. *Corolla: standard* reflexing or occasionally remaining partly folded, broadly obovate to broadly elliptic, emarginate or entire, 9–10 × ca. 8 mm including the 2–3 mm claw, with 2 small raised deltoid calli, bright yellow or orange, centrally infused with dark red around a linear central yellow mark; *wings* obovate to elliptic with a rounded apex, deeply auriculate, 8–10 × 3–4 mm including the 2–3 mm claw, red; *keel* half transversely elliptic, apex obtuse to acute, auriculate to deeply so, 10–13 × 2.5–4 mm including the 4–5 mm claw, pale red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and oblong, 2-celled, basifixed anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, somewhat turgid, 10–15 × 7–10 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, 3.7–4.7 mm long, 2.3–3 mm wide, 1.8–2.3 mm thick, light brown with black mottling; *aril* 1.9–2.2 mm long. (Fig. 36A–F).

**Flowering period:**—May and June. *Fruiting period:* August and September.

**Distribution:**—Western Australia, most frequent in the central to southern wheatbelt; also around Lake King and Hyden, north of Wongan Hills, near Geraldton and near Coolgardie.

**Habitat:**—Undulating or flat country, in sandy gravelly clay, sandy loam, white and yellow sand. The vegetation is woodland dominated by *Eucalyptus wandoo* or heathland, with diverse shrubs in genera such as *Allocasuarina*, *Melaleuca*, *Gastrolobium*, *Grevillea*, *Hakea* and *Xylomelum* Smith (1978: 214).

**Selected specimens (39 examined):**—WESTERN AUSTRALIA. **Avon:** 19 km E of Brookton, 32°19'S, 117°12'E, *J.S. Beard* 3297, 24 May 1964 (PERTH); 3 km SSW of Wedin, 33°00'S, 117°41'E, *M.D. Crisp* 6151, *J. Taylor & R. Jackson*, 26 September 1979 (CBG); 5 km W of Corrigin, 32°20'S, 117°50'E, *M.D. Crisp* 6170, *J. Taylor & R. Jackson*, 26 September 1979 (CBG, PERTH); 3 km WSW of Quairading, 32°01'S, 117°22'E, *M.D. Crisp* 6182, *J. Taylor & R. Jackson*, 27 September 1979 (CBG, MEL); 28 km SE of Dalwallinu, 30°28'S, 116°51'E, *M.D. Crisp* 6507, 17 July 1980 (AD, CBG, NSW, PERTH); 4 km N of Quairading along road to Tammin, 31°59'S, 117°25'E, *M.D. Crisp* 6604, 20 July 1980 (CBG, MEL, NSW, PERTH); near Wagin, 33°19'S, 117°20'E, *C.A. Gardner* 519, 21 June 1920 (PERTH); W of Wongan Hills, *C.E. Woolcock* D18, 15 July 1981 (CBG).

**Affinity:**—*Daviesia cardiophylla* is similar to *D. cunderdin*, *D. euryloba* and *D. umbonata*. It differs from all these species in having ovate to very broadly ovate, often cordate phyllodes. *Daviesia cunderdin* and *D. umbonata* have calli on the calyx below the sinuses, which *D. cardiophylla* lacks. The flower size is much smaller than in *D. cunderdin* (in which the standard is 12–15 mm long) and larger than in *D. euryloba* (standard 8–9 mm long). The keel is very similar to that in *D. umbonata*, but that of *D. cunderdin* lacks a sharp curve at the base, and that of *D. euryloba* is very acute and incurved towards the standard.

**Hybrids:**—*Daviesia cardiophylla* × *D. umbonata*. Specimens intermediate between *D. cardiophylla* and *D. umbonata* are known from around Wongan Hills. See discussion under *D. umbonata*.

**36. *Daviesia umbonata*** Crisp & Chandler (1997: 324). Type: Western Australia, Avon, 4 km N of Moonijin, Dowerin–Cadoux railway line, 30°55'S, 117°06'E, *M.D. Crisp* 6686, 23 July 1980. Holotype: CANB; isotype: PERTH

Bushy, divaricate *shrubs* to 1 m high, muricate to hispid on branchlets, occasionally pedicels hispidulous. *Root anatomy* unknown. *Branchlets* ribbed, thickened at nodes. *Phyllodes* scattered, spreading at 45–90°, flat or slightly concave above, narrowly elliptic to narrowly ovate with an acuminate, pungent apex, basally cuneate (rarely rounded) with a thickened articulation, (7–)10–20(–25) × 2–5(–8) mm; dull green. *Unit inflorescences* 1 or 2 in the axils, 1-flowered; *peduncle* nil; *subtending bracts* spreading, obovate, ca. 1 mm long. *Pedicels* 3–4 mm long. *Calyx* 4–5 mm long including the 1–1.5 mm receptacle, with a small, dark callus just below each sinus (except between the upper 2 lobes) at the base of the calyx lobes; upper 2 lobes united in a truncate lip, 1–1.5 mm long; lower 3 lobes triangular, 0.5–1 mm long. *Corolla: standard* elliptic, emarginate, 6–9 × 6–7 mm including the 2–2.5 mm claw, calli ± indistinct, yellow with dark red infusion at the centre; *wings* elliptic with a rounded apex, auriculate, 7–8 × 2–3 mm including the 2–2.5 mm claw, dull red; *keel* half depressed-ovate, with an acute apex, sharply curved at base, with an angle of ca. 120° between claw and tip, slightly auriculate, 8–9 × 2–3 mm including the 3.5–4.5 mm claw, dull red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and globose,

versatile anthers, thecae confluent; outer whorl of 5 with much shorter, broader, compressed filaments and longer, 2-celled, basifixed anthers; filaments free. *Pod* obliquely very shallowly obtriangular with an acuminate apex, 12–14 × 6–8 mm, light brown with black mottling; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, compressed vertically, 3.8–4 mm long, 2–2.4 mm wide, 1–1.4 mm thick, dark brown; *aril* ca. 1.7 mm long. (Fig. 36G–J).

**Flowering period:**—June and July. *Fruiting period:* July and August.

**Distribution:**—Western Australia, in the Wongan Hills and Manmanning area, and northward.

**Habitat:**—Growing in white slightly clayey sand. The vegetation is kwongan (heath) dominated by *Callitris* and *Allocasuarina*, with myrtaceous shrubs.

**Selected specimens (9 examined):**—WESTERN AUSTRALIA. **Irwin:** ‘Bulma Road’, Walkaway, 28°56’S, 114°48’E, *J.S. Beard* 2515, 31 May 1963 (PERTH); Tabletop Road, 24 km NE of Dongara, *P. Roberts* 800, 14 July 1988 (PERTH); Howathana Road, Nanson, 28°33’S, 114°45’E, *C.E. Woolcock* D35, 17 July 1981 (CBG). **Avon:** 5 km NW of Wongan Hills, 30°50’S, 116°41’E, *M.D. Crisp* 6521, 17 July 1980 (CBG); W of Wongan Hills, *C.E. Woolcock* D90, 15 July 1981 (CBG); Wongan Hills, 30°54’S, 116°43’E, *C.E. Woolcock* D13, 15 July 1981 (CBG)

**Affinity:**—*Daviesia umbonata* is similar to *D. cardiophylla*, *D. cunderdin* and *D. euryloba*. The phyllodes of *Daviesia umbonata* are usually narrow, nearly flat and tapered to a cuneate or occasionally rounded base, unlike those of *D. cardiophylla* (ovate to very broadly so with a cordate base), *D. cunderdin* (with a rounded base and not usually narrow) and *D. euryloba* (folded upwards longitudinally and with a cuneate or rounded base). The calyx in *D. umbonata* has a small callus just below each sinus between adjacent calyx lobes, as in *D. cunderdin*, whereas *D. cardiophylla* normally lacks these calli. Despite the similarities between *D. umbonata* and *D. cunderdin* in leaf shape and calyx calli, the latter species clearly differs in petal characters. The flower of *D. cunderdin* is much larger (e.g. standard 12–15 mm long) and red. Also, the calli on the standard are distinctly deltoid appendages and much larger (0.6–0.7 mm high) than in *D. umbonata*. The keel of *D. euryloba* readily distinguishes it from *D. umbonata*, being sharply hooked inward towards the standard.

**Hybrids:**—*Daviesia cardiophylla* × *D. umbonata*. Some populations around the Wongan Hills area appear to be intermediate between *D. umbonata* and *D. cardiophylla* but typical populations of each species occur elsewhere in the district, which suggests that the intermediates represent occasional hybridisation between otherwise two distinct species and not a zone of introgression (Crisp & Chandler 1997).

**37. *Daviesia cunderdin*** Crisp & Chandler (1997: 322). Type [approximate locality data given because the species is rare]: Western Australia, near Cunderdin, 31°30’S, 117°20’E, *R.J. Cranfield* 10709, 9 May 1996. Holotype: CANB 483975; isotypes: AD, BRI, CANB 483976, HO, K, L, MEL, NSW

Very dense, compact, divaricate *shrubs*, 1.6 m high, ± hispidulous on branchlets, pedicels and phyllode margins and midribs. *Root anatomy* unknown. *Branchlets* diverging at ca. 45°, prominently ribbed. *Phyllodes* scattered, diverging at ca. 45°, elliptic to ovate to narrowly so, with an acuminate apex 3–4 mm long, basally rounded and thickened at the articulation, (6–)10–20 × 4–9 mm; venation obscure but some phyllodes have a slightly wrinkled appearance when dry. *Unit inflorescences* 1(2) in the axils, 1-flowered; *peduncle* nil; *subtending bracts* oblong, keeled, 1–1.5 mm long. *Pedicels* 3–5 mm long. *Calyx* 5–7 mm long including the ca. 1.5 mm receptacle, with a small, dark callus just below each sinus (except between the upper 2 lobes) at the base of the calyx lobes; upper 2 lobes united in a truncate lip with recurved tips, ca. 2 mm long, recurved; lower 3 lobes triangular, ca. 2 mm long. *Corolla* red; *standard* remaining partly folded, broadly obovate to elliptic, emarginate, 12–15 × ca. 12 mm including the 3–4 mm claw, with 2 prominent deltoid calli ca. 0.6–0.7 mm high; *wings* elliptic to narrowly so, apically rounded but neither incurved nor overlapping, auriculate, 13–15 × 4–5 mm including 4–5 mm claw; *keel* half broadly transverse-obovate, acute, ca. 16–17 × 5 mm including the ca. 8 mm claw, petals connate along abaxial margins from base of lamina to tip, claws free. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile, anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, basifixed, 2-celled anthers. *Pod* obliquely shallowly obtriangular, acuminate, ca. 14 × 7 mm; upper suture slightly sigmoid; lower suture acute. *Seed* not seen. (Fig. 36K).

**Flowering period:**—May and June. *Fruiting period:* Unknown.

**Distribution:**—Western Australia, known only from the type locality and its vicinity, near Cunderdin.

**Habitat:**—Lateritic sand, on disturbed sites with remnant kwongan vegetation including *Allocasuarina*, *Callitris* and *Gastrolobium*.

**Conservation status:**—National: Endangered. WA: Critically Endangered, Declared Rare Flora.

**Additional specimens examined:**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Avon:** Near Cunderdin, 31°30'S, 117°10'E, *N.G. Marchant & J. Seabrook s.n.*, May 1993 (CANB, MEL, NSW, PERTH 3705153); *ibid.*, *T.R. Lally 1015, B.J. Lepschi & R.J. Cranfield*, 9 September 1996 (CANB, K, MEL, PERTH).

**Affinity:**—In general aspect, plants of *D. cunderdin* are larger and coarser than any of *D. cardiophylla*, *D. euryloba* or *D. umbonata*. It is most readily distinguished by the flowers, which are red and much larger (e.g. standard 12–15 mm long) than in the more typical 'egg and bacon' (yellow and red) flowers of the genus, as seen in the other three species. Moreover, *D. cunderdin* has a distinctively shaped standard petal, which remains partly folded and bears a pair of deltoid appendages inside at the base. The other three species have a fully opening standard < 10 mm long, with only slightly raised calli. In *D. cunderdin*, the base of the phyllodes is rounded, not cordate as in *D. cardiophylla* nor cuneate like *D. umbonata*. Those of *D. euryloba* are similar in outline to those in *D. cunderdin*, but more or less folded upwards longitudinally, or at least adaxially concave. There are calli below the sinuses of the calyx in both *D. cunderdin* and *D. umbonata*, but these are rare in *D. cardiophylla* and absent in *D. euryloba*.

**38. *Daviesia euryloba*** Crisp & Chandler (1997: 327). Type: Western Australia, Roe, ca. 90 km NE of Ravensthorpe, 9 km SW of Welcome Soak, 33°05'S, 120°46'E, *M.D. Crisp 6030, J. Taylor & R. Jackson*, 21 September 1979. Holotype: CANB; isotype: PERTH

Divaricate *shrubs* to 1.5 m high, smooth, muricate or hispidulous on vegetative parts. *Root anatomy* unknown. *Branchlets* divaricate to ascending, terete, ribbed. *Phyllodes* rather crowded, diverging at ca. 90°, tending to fold up longitudinally, ovate to elliptic to narrowly so, occasionally recurved, apically acuminate and pungent, basally rounded and thickened at the articulation, 7–18 × 3–7 mm. *Unit inflorescences* 1 or 2 per axil, 1-flowered; *peduncle* nil; *subtending bracts* obovate, keeled, ca. 1 mm long, spreading at tips. *Pedicels* 3–5 mm long. *Calyx* 4–6 mm long including the ca. 1 mm receptacle; upper 2 lobes fused into a broad notched lip, ca. 1–1.5 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* broadly elliptic, emarginate, 8–9 × 7–8 mm including the 2–2.5 mm claw, with 2 small calli at the base of the lamina, yellow with red markings; *wings* obovate to elliptic, apex rounded, deeply auriculate, 7–9 × 3–4 mm including the 2–3 mm claw, red; *keel* half depressed-ovate, acute, curving sharply upwards from base, slightly auriculate, 9–10 × 2.5 mm including the 4–5 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, rounder, versatile, confluent anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely very broadly obtriangular, obtuse or nearly so below the short beak, somewhat turgid, 6–7 × 5–6 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, compressed vertically, nuggetty, ca. 3.9 mm long, 2–2.6 mm wide, 1.7–1.9 mm thick, dark brown to black, not mottled; *aril* 1.8–2.2 mm long. (Fig. 36L, M).

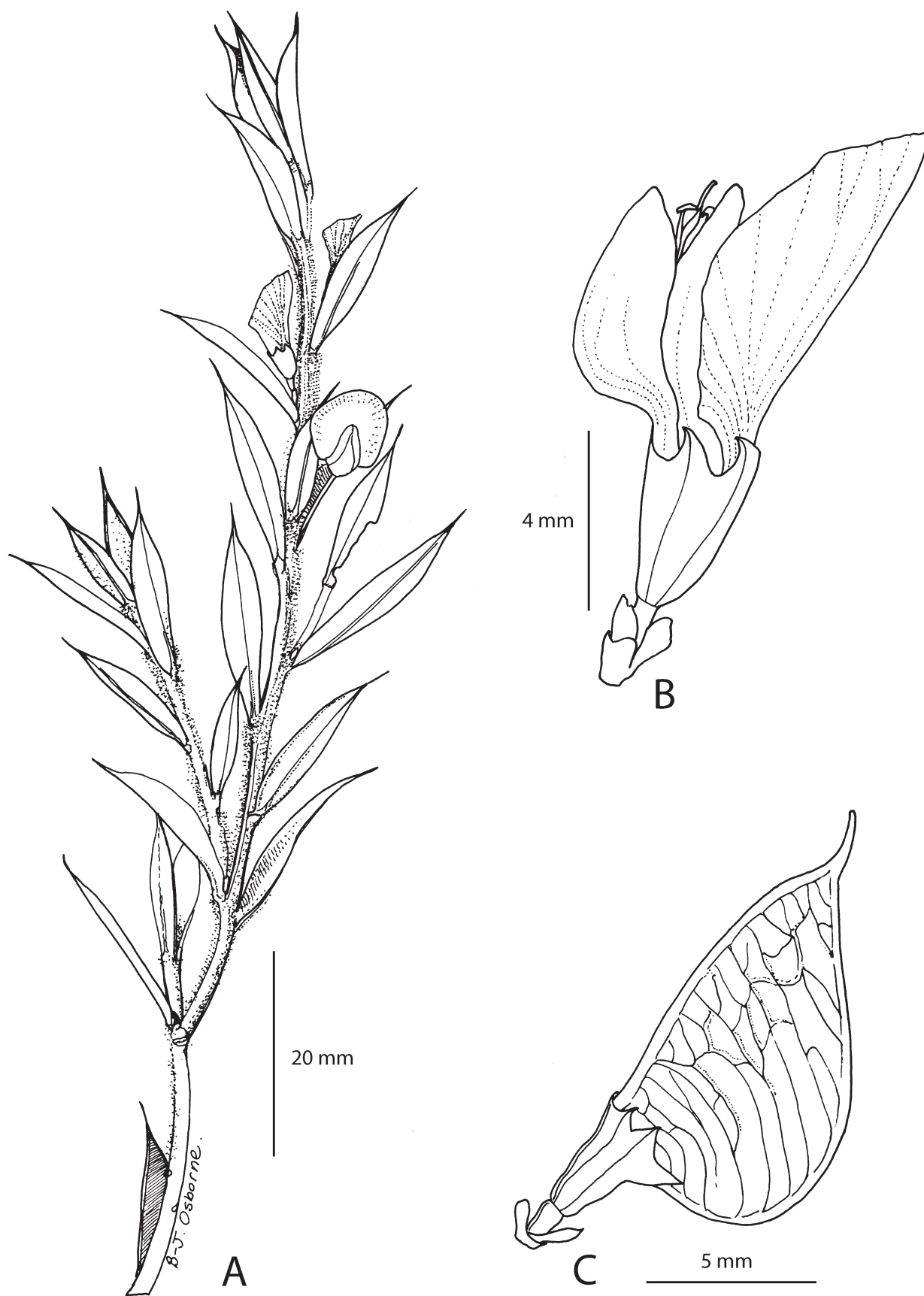
**Flowering period:**—July and August. *Fruiting period:* August to October.

**Distribution:**—Western Australia, from the Ravensthorpe–Lake King area eastward to near Peak Charles National Park and south to the Jerdacuttup area.

**Habitat:**—Sandplains, with deep white sand or gravelly sandy soil. Vegetation predominantly heath and mallee with *Eucalyptus pleurocarpa* a dominant species.

**Selected specimens (10 examined):**—**WESTERN AUSTRALIA. Roe:** Mt Short, N end Ravensthorpe Range, 33°28'S, 120°00'E, *A.S. George 5699*, 30 August 1963 (CANB, PERTH); S of Lake King, *C.E. Woolcock D74*, 1 August 1981 (CBG); 13 km S Mt Glasse, Bremer Range, 32°39'S, 120°46'E, *K. Newbey 5392*, 21 July 1979 (PERTH).

**Affinity:**—*Daviesia euryloba* is closely related to *D. cardiophylla*, *D. cunderdin* and *D. umbonata*. The phyllodes of *D. euryloba* are mostly somewhat folded upwards longitudinally and rounded at the base, whereas those of *D. cardiophylla* are basally cordate or rounded and more or less flat, those of *D. cunderdin* are flat and rounded at the base, and in *D. umbonata* they are basally cuneate and flat or slightly concave. *Daviesia euryloba* lacks the calli below the sinuses of the calyx lobes that are present in *D. cunderdin* and *D. umbonata*. The keel of *D. euryloba* is shaped differently compared with the other three species, curving sharply upwards from the base to the very acute apex. The pod shape of *D. euryloba* is also unique among these species, being more or less obtuse near the apex, and the angle along the lower suture is also wider (closer to 90°) than in the other species.



**FIGURE 37.** *Daviesia abnormis*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A, B from *George 11288*; C from *Crisp 6135*. Drawn by B-J. Osborne.

**39. *Daviesia abnormis*** Mueller (1860: 106), Crisp (1995: 1169). Type: Ad sinum South-West Bay Novae Hollandiae austro-occidentalis. Mxw. Holotype: MEL 84070; isotypes: K, PERTH)

*Latrobea pungens* Benth (1864: 140), *nom. superfl. & illeg.*—*D. abnormis* F.Muell. given as a synonym. *Latrobea abnormis* (F.Muell.) Druce (1917: 631).

*Shrubs*, 0.3–0.7 m high, with corky bark, densely hirsute (white to buff on branchlets and grey on phyllodes) or rarely glabrous. *Root anatomy* unknown. *Branchlets* unarmed, ascending, terete, ribbed. *Phyllodes* crowded near branchlet apex, erect to appressed, folded upwards longitudinally and slightly recurved towards the apex, narrowly elliptic to narrowly obovate, apically acuminate and pungent, basally cuneate and articulate, 13–23 × 3–8 mm. *Unit inflorescences* 1(2) in the axils, 1-flowered, shorter than and almost hidden by phyllodes; *peduncle* nil; *subtending bracts* keeled, spreading, ca. 1 mm long. *Pedicels* 1–3 mm long. *Calyx* 4–5 mm including the 0.5–1.5 mm receptacle; upper 2 lobes united in a truncate lip, ca. 1 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla* yellow with faint red markings: *standard* broadly elliptic, emarginate, 11–13 × 8–10 mm including the 3–4 mm claw; *wings* obovate to narrowly so with a rounded apex, auriculate, ca. 9–11 × 3 mm including the 2.5–3 mm claw; *keel* half transversely broadly ovate, acute, saccate, 10–11 × 2.5–3 mm including the 3–4 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and shorter, rounded, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, basifixed, 2-celled anthers; filaments free. *Pod* obliquely very shallowly obtriangular, acuminate, 11–13 × 5.5–6.5 mm; upper suture slightly sigmoid; lower suture acute but strongly rounded. *Seed* ellipsoid, 3.5–4 mm long, 2.5 mm wide, 1.5–2 mm thick, light orange-brown with or without black mottling; *aril* 1.7–2 mm long. (Fig. 37).

**Flowering period:**—March and April. *Fruiting period:* Unknown.

**Distribution:**—Western Australia, from near Kulin, east to Dragon Rocks, and south to the Stirling Range area and Fitzgerald River National Park.

**Habitat:**—Found in sand, often with quartzite, in mallee-heathland (kwongan) dominated e.g. by *Eucalyptus pleurocarpa*, *E. marginata* and *E. decipiens* Endlicher (1837: 49), with *Allocasuarina* and *Hakea* dominant in the heath layer.

**Selected specimens (17 examined):**—WESTERN AUSTRALIA. **Roe:** 368 km on the Lake Grace–Ravensthorpe road, *E.M. Scrymgeour 407*, 8 April 1966 (PERTH). **Eyre:** Boxwood Hills–Toompup road, 7 km NW of the Chillinup Pool turnoff, 34°18'S, 118°33'E, *M.D. Crisp 6135 et al.*, 25 September 1979 (CBG, PERTH); N end of the Whoogarup Range, Fitzgerald River Reserve, 33°57'S, 119°53'E, *A.S. George 11288*, 17 March 1972 (CANB, PERTH).

**Affinity:**—The distinctive appearance of this species, with its corky bark, crowded hirsute phyllodes and cryptic inflorescences, make it unlikely to be confused with any other in the genus—so much so that its only taxonomic synonym was assigned to another genus. *Daviesia nudiflora* can be similar but lacks corky bark, the phyllodes spread more widely and are almost always glabrous (sparsely hisute in the otherwise dissimilar subsp. *hirtella*), the flowers are more exposed and conspicuous, richly yellow to slightly orange in colour with conspicuous dark red to maroon markings, and there are calli on the standard.

**40. *Daviesia nudiflora*** Meisner (1844: 53), Benth (1864: 79), Crisp (1987a: 251), Crisp (1995: 1214). Type: 'In arenosis sylvae prope Kei-er-mu-lu v. Monger's lake (Perth) d. 16. July 1839. Herb. Preiss. no. 1143. (Drummond n. 226).' Lectotype (Crisp 1995: 1214): *Preiss 1143* (NY, ex Herb. Meisn.); isolectotype: BR, FI-W, G (2 sheets), LD, MEL (3 sheets), MO, P (2 sheets), PERTH, S, W (2 sheets). Syntype: *Drummond 226* (BM, ex Herb. Shuttleworth); isosyntypes: G (2 sheets), K (2 sheets), MEL, OXF, P (2 sheets), W (2 sheets)

*Daviesia drummondii* Meisner (1844: 53), Benth (1864: 80). Type: 'Swan River, James Drummond n. 227.' Holotype: BM; isotypes: G (3 sheets), K (2 sheets), MEL, OXF, P (2 sheets), PERTH, W (2 sheets).

Bushy *shrubs* to 2.5 m high, muricate or rarely hispidulous on branchlets (subsp. *hirtella*). *Root anatomy* normal (unistellar). *Branchlets* ± angular, ribbed. *Phyllodes* either crowded at or near to branchlet apex and reduced to scales at lower nodes, or extending the full length of the branchlet, diverging at 0–90°, ovate to elliptic (or narrowly so) or oblong, flat or partially folded upwards along the midrib, apically acuminate or cuspidate, pungent, base tapered to cordate, inarticulate and decurrent (but nerves thickened at the node in subsp. *hirtella*), 4–50 × 2–18

mm; scale leaves subulate, rigid, keeled, 1–4 mm long. *Unit inflorescences* 1 or 2 per axil of phyllodes or scale-leaves, 1-flowered; *peduncle* 0.5–2 mm long; *bracts* forming an involucre at the base of the peduncle, spreading and undulating to hooded and channelled, keeled or not, fimbriate, sometimes 3-lobed and lacerated (see below). *Pedicels* thickening towards the apex, 2–7 mm long. *Calyx* 3–4.5 mm long including the 1–1.5 mm receptacle, adaxially ventricose; upper 2 lobes united in a truncate lip with outcurved lobes, ca. 1 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* ovate or elliptic (to broadly so) or transversely broadly elliptic, emarginate, 7–12 × 7–11 mm including the 1–2.5 mm claw, with 2 calli at the base of the lamina, yellow to orange with a red to brown centre; *wings* elliptic with a rounded, incurved apex, overlapping to enclose the apex of the keel, auriculate, with the long, slender auricles ± as long as the claw and hooked at the end, 7–10 × 2–4 mm including the 2–4 mm claw, red to deeply so or rarely brown; *keel* half transversely obovate to broadly so, apically acicular, auriculate or not, saccate, 6–10 × 2.5–3 mm including the 3–5 mm claw, red to deeply so or rarely brown. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and shorter, rounder, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, slender, basifixed, 2-celled anthers; vexillary filament slender, tapering towards the apex; filaments cohering. *Pod* obliquely shallowly obtriangular, acuminate, somewhat compressed, 10–14 × 5–9 mm; upper suture sigmoid; lower suture acute and sharply to broadly curved. *Seed* 4–5.5 mm long, 2.5–3.5 mm wide, 1.7–2 mm thick, dark brown with no mottling to light brown or grey with black mottling; *aril* 1.8–3 mm long. (Figs 38, 39).

**Flowering period:**—May to September. *Fruiting period:* August to October.

**Distribution:**—Western Australia, widespread in the northern half of the wheatbelt from Kalbarri southward as far as the Lake Grace region; also, disjunct populations near Bunbury and near Southern Cross.

**Habitat:**—Grows mostly on sandy soils, sometimes clayey, gravelly or loamy, in undulating or flat areas, in mallee-heathland dominated by *Eucalyptus* and *Allocasuarina* spp., with shrubs of Myrtaceae and Proteaceae dominant in the understorey.

**Affinity:**—*Daviesia nudiflora* bears a resemblance to *D. abnormis*, which also has phyllodes produced only near the branchlet apex but differs by being very hirsute and having corky bark; also, the phyllodes more or less clasp the stem, the inflorescences are cryptic and the standard is paler, predominantly yellow, and lacks calli. *Daviesia audax* is also similar to *D. nudiflora* but the growth habit is erect, the phyllodes are never folded upwards longitudinally, have a thickened articulation at the base and are present all the way along the branchlets, the calyx is not ventricose, and the pods are always much larger (18–25 mm long).

**Variation:**—*Daviesia nudiflora* is highly variable in the arrangement and morphology of the phyllodes, although floral and fruit characters are nearly constant. The involucre bracts in this species show much variation in form. The upper bracts in the cluster are longer, more or less spreading or even reflexed, adaxially concave to hooded and channelled, keeled or not and conspicuously fimbriate. The lower bracts in the involucre are more appressed, triangular and shorter, sometimes with a serrate margin. Sometimes the upper involucre bracts tend to be trilobed or lacerated. Some subspecies (subsp. *hirtella* and near-coastal populations of subsp. *nudiflora*) have bracts with spreading, undulate, slightly fimbriate (not lacerate) margins and are only slightly incurved at the apex (more so in subsp. *hirtella* but the bracts are not hooded). In other subspecies (subsp. *amplectens*, *drummondii* and *nudiflora* (inland populations)), the bracts are strongly incurved and hooded at the apex, so that the bract is channelled, and they are also strongly fimbriate and serrate to lacerate or even trilobed.

#### 40a. *Daviesia nudiflora* Meisner (1844: 53) subsp. *nudiflora*

Reference: Crisp (1995: 1216).

Glabrous, bushy *shrubs* to 1.5 m high and 2.5 m broad. *Branchlets* terete, ribbed. *Phyllodes* produced only at and shortly below branchlet apex, spreading at 30–90°, reduced to scales on lower portion of branchlets, ovate to elliptic or obovate, narrow to broad, flat or folded upwards along the midrib, apically acuminate and pungent, tapered or abruptly contracted to the inarticulate, decurrent base, 10–50 × 5–18 mm; venation usually visible, yellow-green to glaucous. *Seedling phyllodes* produced over whole of branchlet, folded upwards longitudinally, with the higher secondary branchlets producing the phyllodes only towards the apex and the phyllodes unfolding, slightly recurved, up to 35 mm long and up to 10 mm wide. *Unit inflorescences* mostly in axils of scale-leaves (not of phyllodes). *Corolla: standard* transversely broadly elliptic, 8–12 × 9–11.5 mm including the claw. *Pod* narrow, acute, 13–14 × 5–6 mm, red. (Figs 38A–C, 39F, G).



**FIGURE 38.** *Daviesia nudiflora*, Part 1, comparing two of four subspecies. *Daviesia nudiflora* subsp. *nudiflora*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. *Daviesia nudiflora* subsp. *amplexans*. D. Flowering branchlet. E. Single-flowered inflorescence in bud. F. Pod. A, B from Crisp 6471; C from Maiden s.n. (NSW 34924); D, E from Crisp 6536 (type); F from Crisp 6432. Drawn by B.-J. Osborne (A–C) and A.L. Prowse (D–F)

**Distribution:**—Western Australia, extending across most of the range of the species.

**Selected specimens (85 examined):**—**WESTERN AUSTRALIA.** Avon: 21.5 km NNE of Quairading along road to Cunderdin, 31°50'S, 117°19'E, M.D. Crisp 6614, 20 July 1980 (CBG, MEL, PERTH); 17 km NW of Quairading, 5.5 km W of Tongerung Well, 31°55'S, 117°17'E, M.D. Crisp 6191 et al., 27 September 1979 (CBG, PERTH); 4 km N of Wongan Hills town, 30°51'S, 116°43'E, M.D. Crisp 6531, 17 July 1980 (CBG, PERTH).



**Coolgardie:** Ca. 64 km E of Southern Cross towards Coolgardie, *M.E. Phillips WA/68-723*, 9 September 1968 (AD, CBG). **Darling:** 1 km N of Mogumber, near bridge, 31°03'S, 116°03'E, *C. Chapman (7)78*, 6 July 1978 (CBG, PERTH); Perth, ca. 32°00'S, 115°50'E, *J.H. Maiden s.n.*, October 1910 (NSW 34924); lower Helena Valley, 32°00'S, 116°20'E, *J. Seabrook 22*, 25 July 1977 (PERTH); 6.8 km E of Carrabah by road, 31°23'S, 118°45'E, *R. Coveny 8357a & B. Habersley*, 12 September 1976 (CANB, K, NSW, PERTH). **Irwin:** 65 km SW of Coorow on road to Green Head, 30°05'S, 115°33'E, *C. Chapman (11)78*, 29 July 1978 (CBG, PERTH); 11 km S of Coolimba–Eneabba Road from 7 km SW of Eneabba, 29°57'S, 115°12'E, *M.D. Crisp 6471*, 15 July 1980 (CBG, MEL, PERTH).

**Affinity:**—This, the typical subspecies, is also the most widespread and variable. Variation occurs mostly in the shape and size of the phyllodes; however, regional patterns are not sufficiently clear to justify further subdivision of this taxon. It is most similar to subsp. *hirtella*, which differs in having node-like thickenings on the nerves at the base of the phyllode and is usually hispid on the branchlets (rarely also on the phyllode margins). The other two subspecies (*amplectens* and *drummondii*) differ in having phyllodes developed all the way along the branchlets.

**40b. *Daviesia nudiflora*** Meisner (1844: 53) subsp. *amplectens* Crisp (1995: 1214). Type: Western Australia, Avon, 8 km NE of Dowerin, 31°09'S, 117°05'E, *M.D. Crisp 6536*, 18 July 1980. Holotype: CBG; isotypes: AD, CANB, K, L, NSW, PERTH

Bushy shrubs to 2.5 m high × 3 m wide. *Branchlets* sharply angular with decurrent midribs. *Phyllodes* produced all along the branchlets, crowded (in typical specimens, margins of adjacent phyllodes are in contact) or closely spaced (up to 5 mm apart), spreading at 60–90°, broadly ovate, concave above, acuminate with a long, rigid, pungent apex, basally amplexicaul and cordate or truncate, 5–18 × 4–15 mm, smooth, glaucous to pruinose. *Unit inflorescences* distributed along branchlets, in axils of phyllodes. *Corolla: standard* broadly ovate, 9–10 × 7–9 mm including the claw. *Pod* sharply curved along lower suture, 10–13 × 7–9 mm. (Figs 38D–F, 39A).

**Distribution:**—Western Australia, in the north-eastern wheatbelt from Mt Collier, NE of Cadoux, south to the area around Dowerin.

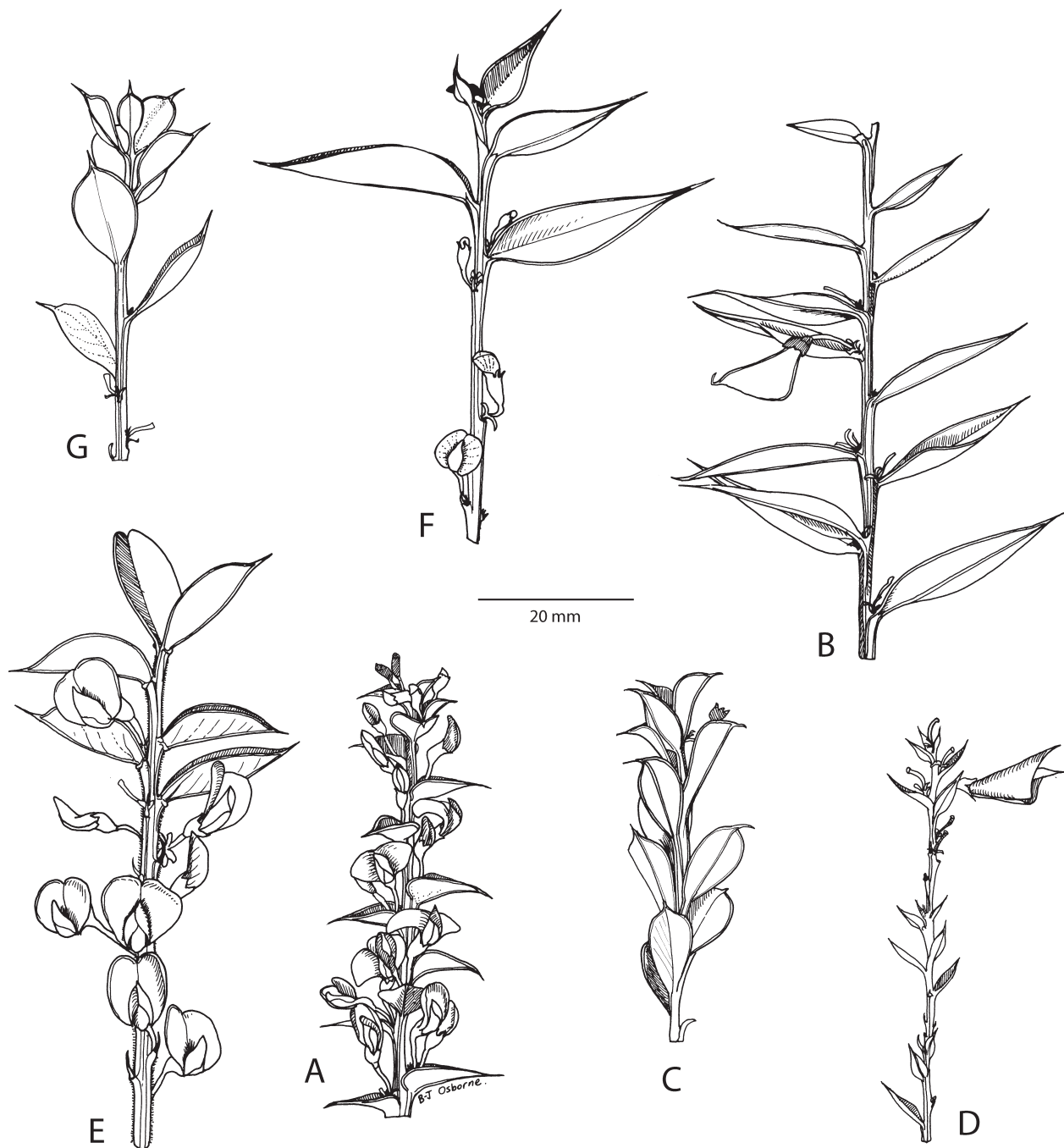
**Selected specimens (12 examined):**—WESTERN AUSTRALIA. **Avon:** Dowerin, 31°12'S, 117°02'E, *B. Rosier 50*, August 1959 (PERTH); 1 km SW of Amery railway station, 31°10'S, 117°04'E, *M.D. Crisp 6342*, 3 October 1979 (AD, CBG, MEL, NSW, PERTH, UWA); Amery town site, western boundary, 31°08'S, 117°05'E, *B.H. Smith 388*, 3 August 1984 (AD, CBG, HO, MEL, NSW, PERTH); Namalcatching Well reserve, 15 km E of Dowerin, *B.V. Smith 1*, 25 April 1981 (CBG); N of Cadoux, 7 km E of Kirwan, *M.D. Crisp 6690*, 23 July 1980 (AD, CBG, K, MEL, NSW).

**Affinity:**—This is the most distinctive of the subspecies of *D. nudiflora* (Crisp 1995) and, if only the typical populations (from around Dowerin) were known, it would be treated as a species. However, some populations north of Cadoux clearly show a link to subsp. *drummondii*, as seen in the wider spacing of the nodes, the slightly narrower shape of the phyllodes, and a glaucous rather than pruinose epidermis, e.g. *Lally & Lepschi TR 1113* (CANB, PERTH) from Petrudor Rocks area and *B.V. Smith 5* (CBG 8102467) from near Mt Collier.

**40c. *Daviesia nudiflora*** Meisner (1844: 53) subsp. *drummondii* (Meisn.) Crisp (1995: 1214). *Daviesia drummondii* Meisner (1844: 53), Bentham (1864: 80). Type: 'Swan River, James Drummond [coll. II] n. 227.' Holotype: BM; isotypes: G (3 sheets), K (2 sheets), MEL, OXF, P (2 sheets), PERTH, W (2 sheets)

*Daviesia nudiflora* Meisn. var. *lanceolata* Bentham (1864: 79). Type: 'Drummond n. 133.' Lectotype (Crisp 1995: 1214): K (sheet labelled 'Negative no. Kew 939'); isolectotype: K, MEL 79066–7.

Bushy shrubs to 1.5 m high. *Branchlets* angular with decurrent ribs. *Phyllodes* produced all along the branchlets, spaced 3–10 mm apart, ascending at 0–30(–45)°, ovate to elliptic or occasionally obovate, usually narrow to linear, concave above or flat, apically acuminate, pungent, tapered to the base, 4–20 (30) × 2–6 mm, minutely scabrid, glaucous to yellow-green. *Unit inflorescences* distributed along branchlets, in axils of phyllodes. *Corolla: standard* transversely broadly elliptic, 7–9 × 7–9 mm including the claw. *Pod* narrow, broadly curved along lower suture, 11–14 × 5–6 mm. (Fig. 39B–D).



**FIGURE 39.** *Daviesia nudiflora*, Part 2, comparing branchlets of all four subspecies. A. *Daviesia nudiflora* subsp. *amplexens* (from Crisp 6690). B–D. *Daviesia nudiflora* subsp. *drummondii*. (B from Drummond 133, type of synonym *D. nudiflora* var. *lanceolata*; C from Drummond coll. II no. 227, type of basionym *D. drummondii*; D from Crisp 6203). E. *Daviesia nudiflora* subsp. *hirtella* (E from George 2599). F, G. *Daviesia nudiflora* subsp. *nudiflora* (F from Phillips WA/68-723; G from Crisp 6531). Drawn by B.-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Distribution:**—This subspecies occurs in the central wheatbelt of Western Australia, from Ballidu south to York and east to Corrigin.

**Selected specimens (32 examined):**—**WESTERN AUSTRALIA. Avon:** Wongan Hills, near Research Station, 30°49'S, 116°37'E, *A.S. George 3705*, 16 June 1962 (PERTH); 8 km E of Goomalling, 31°16'S, 116°55'E, *R.D. Royce 7503*, 18 August 1962 (PERTH); 5.5 km SW of Cunderdin, 31°41'S, 117°11'E, *M.D. Crisp 6203 et al.*, 27 September 1979 (CBG, PERTH); Tammin, 31°38'S, 117°29'E, *J.H. Maiden s.n.*, September 1909 (NSW 34923).

**Affinity:**—This taxon is a complex suite of populations which vary considerably in the shape of their phyllodes, even in the same stand. It occurs in the central wheatbelt, immediately south and west of subsp. *amplectens*. The defining character is the production of basally tapered phyllodes all the way along the branchlets; also, the phyllodes are mostly narrower than in the other subspecies. In subsp. *nudiflora* and subsp. *hirtella*, phyllodes are developed only near the apex of the branchlets, with long naked stems below with scale-leaves that subtend most of the flowers (hence the name of the species). The fourth subspecies, *amplectens*, resembles subsp. *drummondii* in developing phyllodes all along the stems, but differs because the phyllodes are crowded, widely spreading, heart-shaped, stem-clasping, broader (4–15 mm) and glaucous to pruinose.

**40d. *Daviesia nudiflora*** Meisner (1844: 53) subsp. *hirtella* Crisp (1995: 1216). Type: Western Australia, Darling, 10 km N of Regans Ford, 30°55'S, 115°39'E, *M.D. Crisp 6460*, 15 July 1980. Holotype: CBG; isotype: PERTH

*Branchlets* terete, ribbed, muricate to hispidulous on branchlets, sometimes also on phyllode margins, ± viscid on pedicels and pods. *Phyllodes* produced only at and shortly below branchlet apex, spreading at 45–60°, reduced to scales on lower portion of branchlets, elliptic to oblong, somewhat folded upwards along the midrib, apically acuminate, pungent, abruptly contracted to the inarticulate base and decurrent but with node-like thickenings on midrib and marginal nerves, 10–40 × 5–16 mm, yellow-green to glaucous; venation visible, muricate. *Unit inflorescences* mostly in axils of scale-leaves rather than phyllodes. *Corolla: standard* transversely broadly elliptic, 9–10 × 8–10 mm including the claw. *Pod* obliquely very shallowly obtriangular, 11–12 × 5–8 mm. (Fig. 39E).

**Distribution:**—Western Australia, north of Perth, from the Kalbarri area south to Regans Ford and inland towards Corrigin.

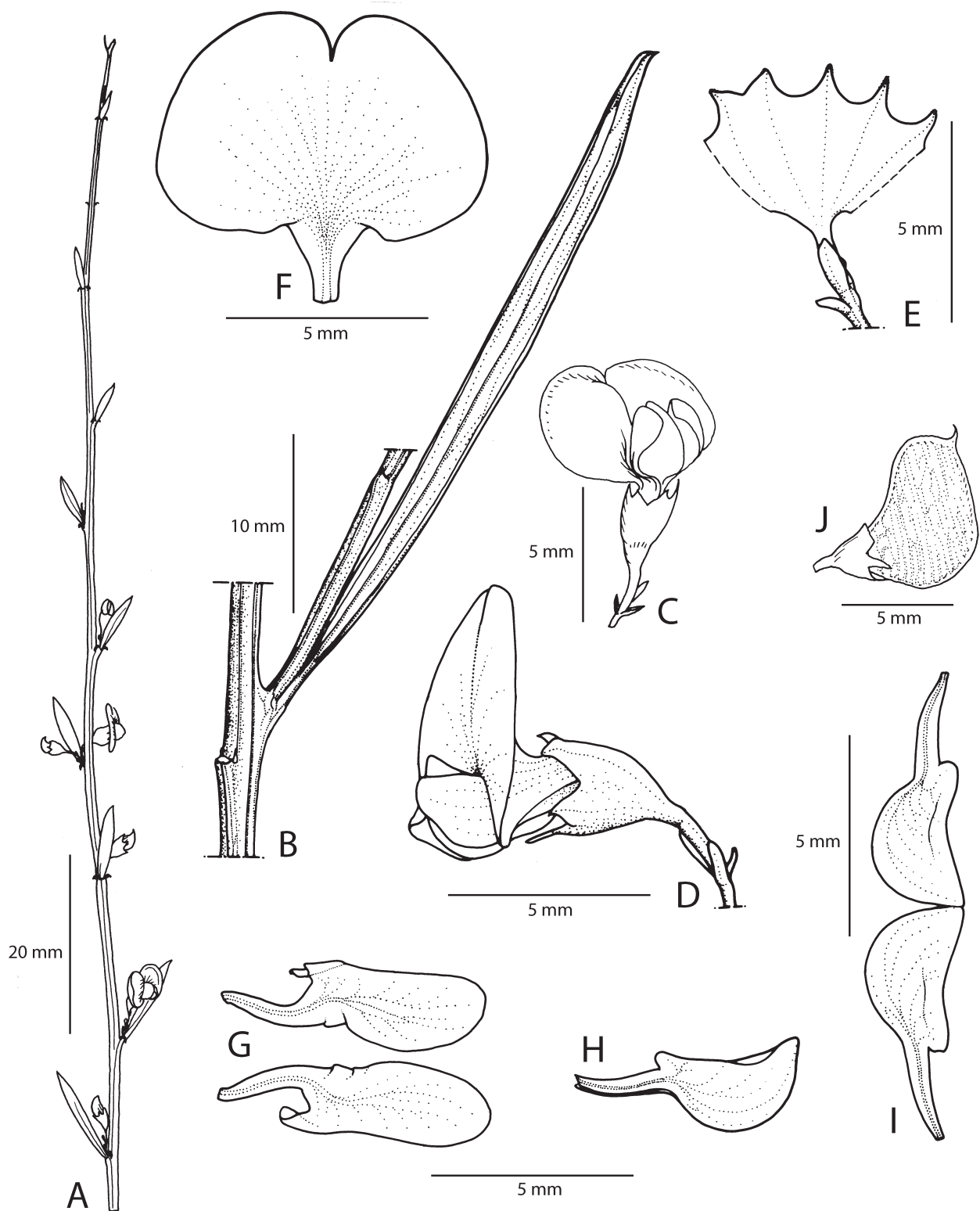
**Selected specimens (24 examined):**—WESTERN AUSTRALIA. **Avon:** 8 km SE of Badgingarra, 30°24'S, 115°33'E, *A.S. George 2599*, 19 June 1961 (PERTH). **Irwin:** 18 km W of Arrino, 29°25'S, 115°22'E, *C. Chapman (48)77*, 21 August 1977 (CBG, PERTH); 1 km S of Marchagee, 30°04'S, 116°04'E, *M.D. Crisp 6486*, 16 July 1980 (CBG, MEL); 37 km from Coorow towards Green Head, 30°02'S, 115°47'E, *C. Chapman (10)76*, 4 July 1976 (CBG).

**Affinity:**—This subspecies is obviously similar to subsp. *nudiflora* and is distinguished mainly by the 3 thickenings at the base of the phyllodes, one on each nerve; also, it frequently has hispidulous branchlets, whereas subsp. *nudiflora* always appears glabrous, though is muricate under magnification. The other two subspecies are distinguished by having phyllodes developed all the way along the branchlets.

**41. *Daviesia grahamii*** Ewart & J.White in Ewart *et al.* (1909: 12), Crisp (1981: 149), Crisp (1991a: 264), Crisp (1995: 119). Type: 'Jibberding and Watheroo Rabbit Fence, West Australia, M. Koch, 1905, No. 1365.' Lectotype (Crisp 1991a: 264): Jibberding, *M. Koch*, October 1905 (MEL 78090); isolectotype: MEL 78092, NSW 34935 & 34956; syntype: Watheroo Rabbit Fence, *M. Koch*, September 1905 (MEL 78091); isosyntype: AD, K (2 sheets), P, PERTH

*Daviesia phyllodinea* Moore (1920: 168). Type: Western Australia, Belka, *F. Stoward 352*, 1917. Holotype: BM.

Intricate, many-stemmed *shrubs*, 0.2–0.5(–0.7) m high and 1 m broad, appearing glabrous but minutely scabrous. *Root anatomy* normal (unistelar). *Branchlets* ascending, angular, ribbed. *Phyllodes* scattered, erect, narrowly obovate, oblong or elliptic to linear, obtuse to acute at apex, apiculate with a hard point but not or scarcely pungent, slightly recurved at margins, tapered to the articulate base, 0–50(–80) × 0–3(–8) mm, rigid, dull green to yellow-green; venation prominent, especially midrib and 2 longitudinal intramarginal veins (in broader phyllodes, anastomosing lateral veins are also visible); phyllodes reduced, sometimes to scales, towards branchlet apex; *stipules* present, erect to recurved, subulate, 0.6–1.1 mm long. *Unit inflorescences* 1–4 per axil, 1–(2)-flowered, appearing sessile; *peduncle* 0.8–2.5 mm long; *subtending bracts* erect to spreading at 45°, narrowly obovate-oblong or linear, fimbriate, with slightly incurved margins, ca. 1.5 mm long. *Pedicels* 1.4–3.2 mm long. *Calyx* 3.0–3.5 mm long including the 0.8–1.1 mm receptacle to which it is contracted, lightly 5-ribbed, variably tinged purple, especially on ribs, apices and sinuses; lobes acuminate or apiculate; upper 2 broadly to shallowly triangular, united scarcely to distinctly higher than lower 3, 0.75–1.5 mm long; lower 3 lobes broadly triangular, 0.5–1 mm long. *Corolla: standard* depressed-ovate or transversely elliptic, emarginate, 7–8 × 7.5–8.5 mm including the 1.5–3 mm claw, richly yellow to orange-yellow, infused with dark red around the oblong yellow centre; *wings* obovate-



**FIGURE 40.** *Daviesia grahamii*. A. Flowering branchlet. B. Phyllode with minute stipules. C, D. Inflorescences (1-flowered). E. Calyx opened out, upper lobes at left. F. Standard. G. Wings. H. Keel. I. Same, opened out. J. Pod. A, C–J from *Crisp 5905*; B. from *Beaglehole 59830*. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

oblong, angled upward, rounded and slightly overlapping at apex, auriculate,  $6\text{--}7 \times 2\text{--}2.25$  mm including the 2–2.5 mm claw, dark red with yellow or orange tips; *keel* half broadly obovate to depressed-obovate, acute to scarcely obtuse, saccate, auriculate,  $5\text{--}6 \times 2\text{--}2.5$  mm including the ca. 2 mm claw, maroon. *Stamens* strongly dimorphic:

inner whorl of 5 with longer, slender, angular filaments and discoid, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and compressed, ovoid to obloid, basifixed, 2-celled anthers; filaments free, adaxial 3 dilated towards apex. *Pod* obliquely very broadly obtriangular, obtuse, very compressed, 6–8 × 4–6 mm, conspicuously reticulate, speckled with purple when immature, straw-coloured at maturity; upper suture strongly sigmoid; lower suture acute. *Seed* not seen. (Fig. 40).

**Chromosome number:**— $2n = 18$ ; voucher *Sands 639.1.6* (Sands 1975).

**Flowering period:**—July (in north) to October (in south). *Fruiting period:* From November.

**Distribution:**—Western Australia, widespread in the interior, from the Little Sandy Desert southward to the eastern margins of the wheatbelt. The occurrence in the Townsend Ridges, near Warburton, suggests that this species may eventually be found in South Australia or the Northern Territory.

**Habitat:**—In the arid zone, this species grows in deep red sand with spinifex (*Triodia*) hummock-grassland. In semi-arid country farther west and south, it occurs in sand or clayey sand (more yellow than red), with tall shrubby vegetation dominated by genera such as *Acacia*, *Allocasuarina*, mallee eucalypts, *Grevillea*, *Hakea* and *Triodia*.

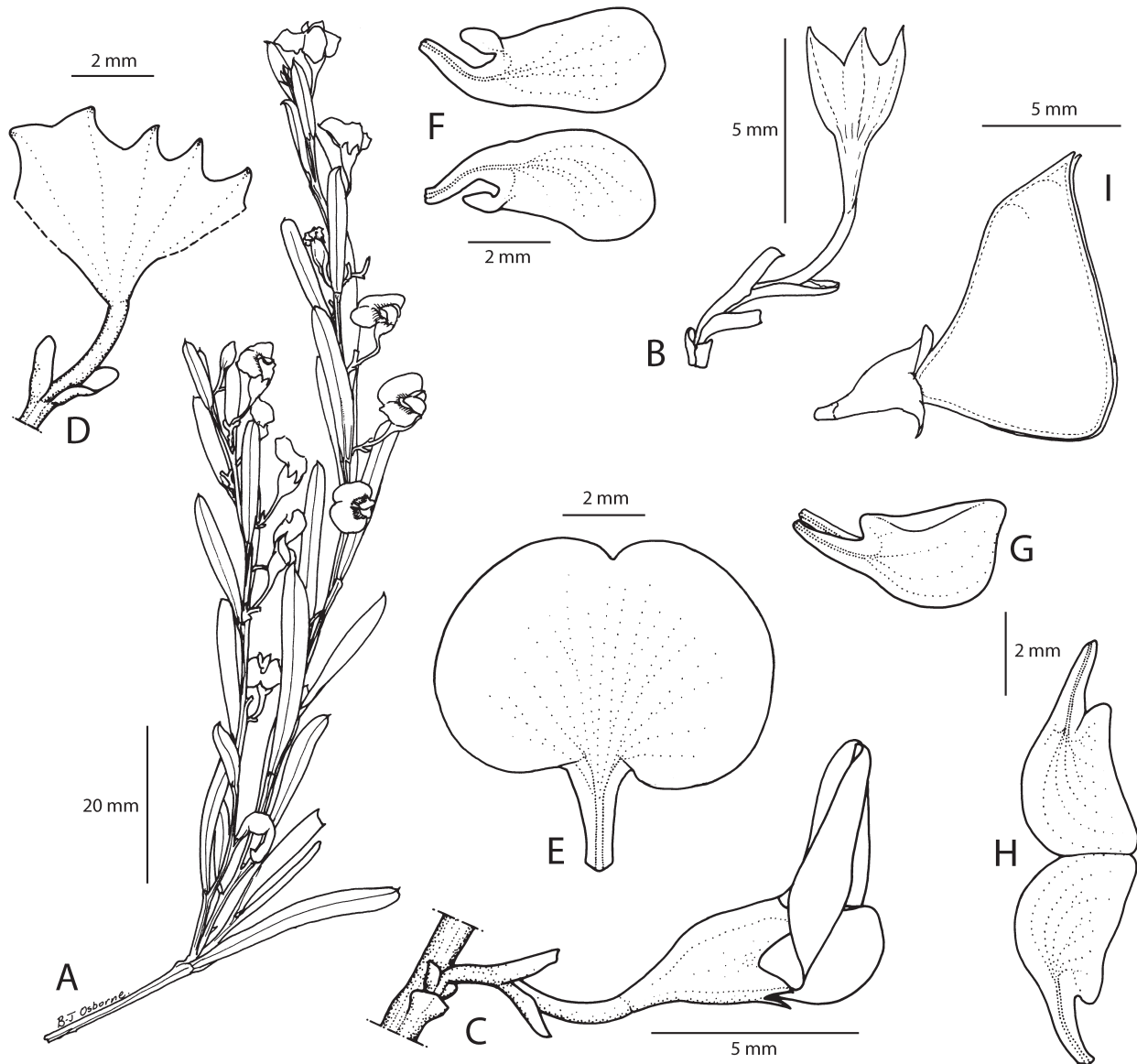
**Selected specimens (41 examined):**—WESTERN AUSTRALIA. **Avon:** Pindar, 28°29'S, 115°47'E, *W.E. Blackall 649*, 14 September 1931 (2 sheets in PERTH); Totadgin, 31°35'S, 118°12'E, *Wilson & Herbert s.n.*, November 1920 (PERTH 2727358). **Austin:** 29 km E of Sandstone, 28°15'S, 119°19'E, *A.S. George 8008 p.p.*, 13 September 1966 (CANB, MO, NSW, PERTH); 21 km NW of Albion Downs Woolshed, 27°10'S, 120°14'E, *N.H. Speck 1473*, 17 September 1958 (CANB, PERTH); 5 km W of Paynes Find, 29°16'S, 117°38'E, *P.G. Wilson 8644*, 7 August 1969 (AD, CANB, DNA, MEL, PERTH). **Coolgardie:** 32 km E of Southern Cross, 31°18'S, 119°39'E, *M.D. Crisp 5573*, 30 January 1979 (CBG, PERTH); near Queen Victoria Rock, 31°19'S, 120°55'E, *M.D. Crisp 5904 et al.*, 18 September 1979 (CBG, MEL, PERTH); 17 km N of Bullfinch on road to Mount Jackson, 30°49'S, 119°06'E, *V.E. Sands 639.1.6*, 3 September 1963 (PERTH, SYD). **Helms:** Townsend Ridges, NE of Laverton, 26°20'S, 127°00'E, *C. de Clarke 137*, July 1916 (PERTH); 30 km NE of Laverton, 28°21'S, 122°36'E, *A.C. Beaglehole 59830 & E.G. Errey 3530*, 16 September 1978 (Herb. Beaglehole, BISH, CANB, L, LTB, MEL, NSW, PERTH). **Keartland:** Little Sandy Desert. 27.2 km ESE of East Kulonoski Well, 24°42'S, 120°27'E, *S. van Leeuwen 5175*, 8 September 2002 (CANB, PERTH).

**Affinity:**—*Daviesia grahamii* is diagnosed from its close relatives by its relatively conspicuous stipules (0.6–1 mm long), which are longer than in other species in the genus, except *D. pachyloma*. However, *D. pachyloma* differs markedly in multiple characters, most obviously its differently shaped phyllodes and terminal racemes. Both *D. leptophylla* and *D. newbeyi* are closely related to *D. grahamii*, especially the latter. *Daviesia newbeyi* may be distinguished by its lack of obvious stipules (present but < 1 mm long) and longer calyces (4.8–5.6 mm long including the receptacle) with the upper 2 lobes united into a truncate lip. *Daviesia leptophylla* differs by its lack of obvious stipules (present but < 0.5 mm long), several flowers per unit inflorescence and non-acuminate calyx-lobes.

**42. *Daviesia newbeyi*** Crisp (1991a: 266), Crisp (1995: 1213). Type [approximate locality data given because the species is rare]: Western Australia, S of Ravensthorpe, *K.R. Newbey 5122*, 18 September 1978. Holotype: CBG; isotypes: AD, BISH, BRI, K, L, MEL, MO, NSW, PERTH

Bushy, multi-stemmed, broom-like *shrubs* to 1.5 m tall (sometimes much lower, 20–50 cm), shooting from root suckers, appearing glabrous but minutely scabrous along phyllode margins and branchlet ribs, sometimes glaucous. *Root anatomy* unknown. *Branchlets* erect, angular with prominent ridges; lateral branchlets often short and ± spinescent. *Phyllodes* somewhat crowded, erect, narrowly oblong to linear, obtuse, apex mucronate and slightly recurved, margins thickened and usually slightly recurved, contracted to the articulate base, 5–40 × 1.5–3.5 mm, rigid, dull yellow-green or glaucous; venation longitudinal but obscure; phyllodes reduced towards branchlet apex and often twisted spirally up to one turn; *stipules* present but minute, ca. 0.1 mm long. *Unit inflorescences* 1 per axil, 1-flowered; *peduncle* 0.75–4 mm long; *barren basal bracts* similar to subtending bracts but progressively smaller downwards; *subtending bracts* ± reclinate, narrowly oblong, 0.75–1.5 mm long, margins folded inwards, apex strongly incurved. *Pedicels* 2–5 mm long, curved or bent upward above the middle. *Calyx* 4.75–5.5 mm long including the ca. 1.5 mm receptacle to which it is contracted, obscurely 5-ribbed, ± tinged purple on ribs, apices and sinuses; lobes ± acuminate; upper 2 united in a truncate emarginate lip, 1–1.5 mm long; lower 3 lobes broadly triangular, 0.75–1 mm long. *Corolla: standard* depressed-ovate, emarginate, 7.5–8 × 7.5–8 mm including the 2–3

mm claw, orange with dark red markings surrounding an intensely yellow cuneate spot at centre; *wings* obovate-oblong or elliptic-oblong, rounded and incurved at apex, strongly auriculate, ca.  $6 \times 2\text{--}2.5$  mm including the ca. 2 mm claw, dark red, paler at tips; *keel* half transversely elliptic, acute, saccate, auriculate,  $5\text{--}5.25 \times 2.25\text{--}2.5$  mm including the 1.5–2.5 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, angular filaments and discoid-ovoid, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and compressed, ovoid to oblong, basifixed, 2-celled anthers; filaments free, adaxial 3 dilated upwards. *Pod* obliquely shallowly obtriangular, acute, compressed,  $9\text{--}11 \times 6\text{--}7$  mm, reticulate; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 41).



**FIGURE 41.** *Daviesia newbeyi*. A. Flowering branchlet. B, C. Single-flowered inflorescences. D. Calyx opened out, upper lobes at left. E. Standard. F. Wings. G. Keel. H. Same, opened out. I. Pod. A–H from *Newbey 5122* (type); I from *Crisp 5034*. Drawn by B-J. Osborne and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Flowering period:**—August to early October (individual plants flower for long periods). **Fruiting period:** Unknown.

**Distribution:**—Known from a few scattered localities in southern Western Australia. Three localities (including the type) are south of Ravensthorpe and other populations are near Lake Grace, south of Coolgardie and NE of Esperance.

**Habitat:**—At the type locality, *D. newbeyi* grows in stony arkosic sand over granitic parent material on an

exposed, well-drained slope, in open-heath. A nearby population is on skeletal clay in tall heath dominated by *Allocasuarina*. At the site south of Coolgardie (*Crisp 5912*), the substrate is yellow sand and the vegetation a tall closed-heath dominated by mallee eucalypts and other myrtaceous shrubs. The species is also known from sand over limestone.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (12 examined):**—Approximate locality data are given because the species is rare. **WESTERN AUSTRALIA. Coolgardie:** SSW of Coolgardie, 31°30'S, 120°50'E, *M.D. Crisp 5912 et al.*, 18 September 1979 (CBG). **Roe:** N of Kuender, 32°50'S, 118°30'E, *C.E. & D.T. Woolcock D229*, 18 September 1982 (CBG); vicinity of Mt Buraminy, 33°20'S, 123°10'E, *W.R. Archer 1008911*, 10 August 1991 (CBG, MEL). **Eyre:** NW of Hopetoun, 33°50'S, 120°E, *M.D. Crisp 5034*, 3 January 1979 (CBG, PERTH); *ibid.*, *K. Newbey*, 30 May 1970 (PERTH); S of Ravensthorpe, 33°40'S, 120°E, *C.E. & D.T. Woolcock D228*, 18 September 1982 (CBG).

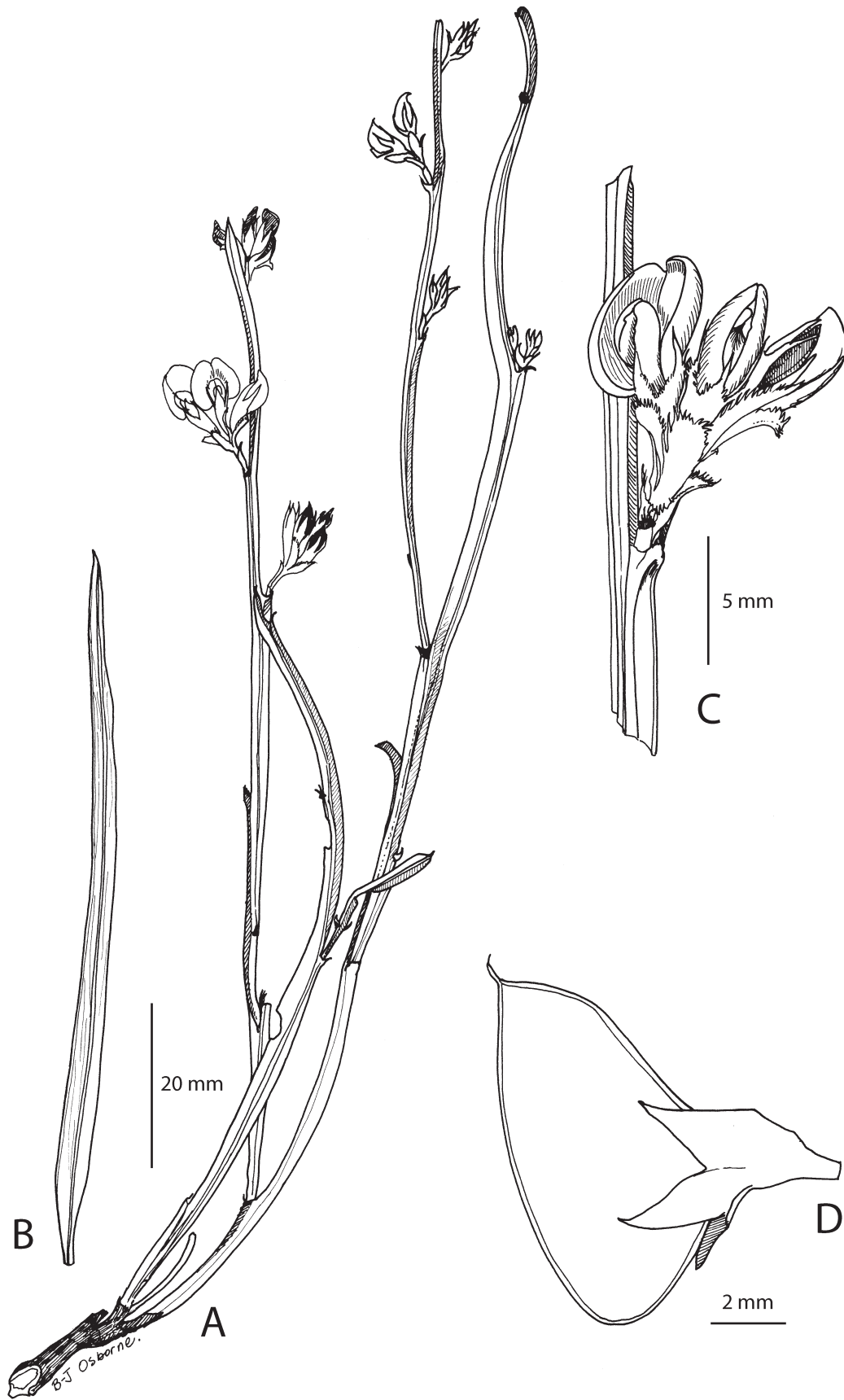
**Affinity:**—In morphology, *D. newbeyi* appears closely related to *D. grahamii*, and this is supported by cladistic analysis. These species share three synapomorphies within the *D. latifolia* group (Crisp 1991a): single-flowered unit inflorescences, acuminate calyx-lobes and scabrid vestiture. Nevertheless, *D. newbeyi* is readily diagnosed from *D. grahamii*. The latter differs in having smaller calyces (3–3.5 mm long including the receptacle) with the upper 2 lobes not or scarcely more united than the lower 3. Also, the pods of *D. grahamii* are shorter (6–8 mm long) and are differently shaped, being distinctly rounded overall and obtuse at the apex. Both species have discernible stipules but in *D. grahamii* they are much larger, being 0.6–1.1 mm long and visible to the naked eye. Furthermore, *D. grahamii* lacks the distinctive bract shape (folded upwards longitudinally, with a sharply incurved apex) seen in *D. newbeyi*. Usually, *D. grahamii* has multiple unit inflorescences per axil, whereas *D. newbeyi* has only singles.

**Variation:**—Most specimens of *D. newbeyi* are consistently similar and all show the diagnostic characters described above. However, the collection *Crisp 5912* from south of Coolgardie appears somewhat different. The plant was very low in stature (10–20 cm) compared with the heights recorded for the others (0.5–1.5 m), although this may only reflect recent burning. Also, the phyllodes are twisted about their long axis by up to a single turn, a character not seen in the other specimens. Thirdly, the phyllodes are somewhat glaucous, like those of *Woolcock D229*, which is otherwise typical of the species. Further collections are needed to determine the significance of these small differences. Meanwhile, we include this specimen in *D. newbeyi* because it shows the diagnostic characters of the species.

**43. *Daviesia alata*** Smith (1808b: 259), Bentham (1864: 89), Crisp (1995: 1169), Crisp (2002: 526). Type: '...found by Dr White near Port Jackson...' Holotype: LINN

Prostrate or procumbent *shrubs* to 1 m diam., with a woody rootstock, glabrous. *Root anatomy* normal (unistelar). Mature *branchlets* leafless and modified to cladodes, triquetrous, flattened or compressed, winged, 1.5–6 mm broad, smooth, dark green. *Phyllodes* reduced to scales or, in young plants, developed and narrowly obovate to linear and 30–60(–90) × 3–12 mm. *Unit inflorescences* 1 per axil, racemose, condensed, 2–5-flowered; *peduncle* 0.8–3.5 mm long; *rachis* 0–1 mm long; *subtending bracts* obovate to elliptic, markedly fimbriate, 2–4 mm long. *Pedicel* 1.5 mm long. *Calyx* 4.5–6 mm long including the 0.8–1.1 mm receptacle; lobes subequal, acuminate, fimbriate towards the base, ca. 2.5 mm long; upper 2 lobes united slightly higher, closer together and broader at the base than the lower 3. *Corolla: standard* depressed-ovate, emarginate, ca. 6–7 × 7 mm including the 1.5 mm claw, orange-red with a yellow centre; *wings* obovate with a rounded apex, strongly contracted towards the base, auriculate, ca. 6 × 2.5–3 mm including the 2 mm claw, maroon; *keel* half depressed-obovate, acute, auriculate, saccate, ca. 4 × 2 including the 1.5 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with shorter, terete, variable length filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with longer, broader, compressed filaments and longer, oblong, 2-celled, basifixed anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, compressed, 9–10 × 6–7 mm; upper suture strongly sigmoid; lower suture acute. *Seed* oblong to ellipsoid to unevenly globose, slightly compressed, 2.5–2.7 mm long, 1.4–1.8 mm broad, 1.1–1.2 mm thick, pale brown with black mottling; *aril* 1.4–1.5 mm long. (Fig. 42).

**Flowering period:**—October to December. *Fruiting period:* November to January.



**FIGURE 42.** *Daviesia alata*. A. Leafless flowering stem. B. Phyllode from a juvenile plant. C. Inflorescence. D. pod. A, C from *Crisp* 6774; B from *Crisp* 2497; D from *Woolls s.n.* (MEL 77407). Drawn by B-J. Osborne.



**Distribution:**—New South Wales, from Nelson Bay on the North Coast, south to Ben Boyd National Park on the south coast, and inland as far as the Blue Mountains and Mittagang in the Central Tablelands, and the Budawang Range in the Southern Tablelands.

**Habitat:**—Poor sandy to clayey soils over sandstone, in heath or dry sclerophyll forest.

**Selected specimens (66 examined):**—**NEW SOUTH WALES. Central Tablelands:** 0.5 km W of Wingello oval, 34°41'S, 150°10'E, *M.D. Crisp 2497* (CBG); Carrington Falls, 5.5 km SE of Robertson, 34°37'S, 150°37'E, *M.D. Crisp 6774* (BM, CBG, MEL, PERTH); 6.5 km from Penrose toward Bundanoon, 34°40'S, 150°16'E, *M.D. Crisp 6789*, 14 October 1980 (AD, CBG, NSW, US). **Southern Tablelands:** Near Wog Wog Creek, 25 km from Mongarlowe toward Nerriga, 35°16'S, 150°02'E, *M.D. Crisp 7936*, 25 January 1987 (CBG, JRAU, NSW).

**Affinity:**—The only other species in the genus with phyllodes reduced to scales and narrowly winged, triquetrous cladodes is *D. pteroclada*. However, this species is not closely related to *D. alata*, differing in floral and fruiting morphology; for example, the bracts and calyx lobes are entire, and the peduncle of the raceme is very short (ca. 1 mm long). Also, *D. pteroclada* has an erect, broom-like habit.

**44. *Daviesia corymbosa*** Smith (1805: 507), Bentham (1864: 76), Crisp (1991a: 290), Crisp (1995: 1183), Crisp (2002: 525). Type: [Port Jackson]. Holotype: 'Hawksbury river, N. S. Wales, coll. Paterson, [ex Herb.] J. Banks, 1798' (LINN)

*Daviesia macrophylla* Endl. in Endlicher & Fenzl (1839: 15). Type: 'Colitur in horto Hugeliano.' Lectotype (Crisp 1991a: 290): W (sheet bearing a fertile specimen with three phyllodes); isolectotype: W (sheet with a single phyllode).

Slender, multi-stemmed, open *shrubs*, to 2 m tall, glabrous. *Root anatomy* unknown. *Branchlets* ascending or arching, angular, lightly ribbed, usually with lower nodes leafless. *Phyllodes* scattered, ascending, obovate, elliptic or ovate, usually narrowly so, or linear,  $\pm$  undulate, long-acute to rounded at apex, entire or obscurely crenulate, basally tapered or cuneate, finally contracted to a (sometimes obscure) pseudo-petiole 2–10 mm long, articulate, 20–120(–180)  $\times$  (2–)5–25 mm, prominently reticulate, coriaceous, light to dull green. *Juvenile phyllodes* similar to adults, proportionally broader; *intermediate phyllodes* much larger, to 200 mm long and 60 mm broad. *Unit inflorescences* 1–2(–4) per axil, umbelliform or corymbose, 5–20-flowered; *peduncle* 5–25 (35) mm long; *rachis* 5–25(–45) mm long. *Calyx* campanulate, 4.3–6.0 mm long including the 1.4–2.2 mm receptacle to which it is constricted at the base, variably infused and spotted with purple at the apices, sinuses and on the body; upper 2 lobes broadly to shallowly triangular, acute, united a little higher than lower 3, 0.9–1.4 mm long; lower 3 lobes ca. equal, triangular to broadly triangular, acute or acuminate, 0.8–1.3 mm long. *Corolla: standard* very broadly ovate to depressed-ovate, emarginate, cordate, 6.9–9.0  $\times$  7.7–11.1 mm including the 1.7–2.4 mm claw, rich yellow to orange-yellow with a red-brown infusion surrounding an intense yellow bilobed marking at centre; *wings* obovate or obovate-oblong, rounded and incurved at the apex, strongly auriculate, 6.5–7.6  $\times$  2.5–3.8 mm including the 2.4 mm claw, red-brown grading to yellow at the apex; *keel* half depressed-obovate or transversely elliptic, acute to scarcely obtuse, saccate, auriculate, 5.1–6.0  $\times$  2.5–3.0 mm including the 1.9–2.4 mm claw, red, very dark at apex. *Stamens* strongly dimorphic: inner whorl of 5 with terete filaments and discoid or compressed broadly ovoid, versatile anthers with confluent thecae; outer whorl of 5 with compressed filaments slightly dilated upwards, and compressed, ovoid or broadly ovoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly to very broadly obtriangular, acute or scarcely so, compressed, 8–11  $\times$  5–8 mm, usually red-brown, lustrous, faintly reticulate or nearly smooth; upper suture strongly sigmoid; lower suture acute. *Seed* compressed ovoid, 2.8–4.4 mm long, 1.8–2.5 mm broad, 1–1.7 mm thick, reddish brown with black mottling; *aril* obloid, with a fleshy distal lobe, 1.6–2.8 mm long. (Fig. 43).

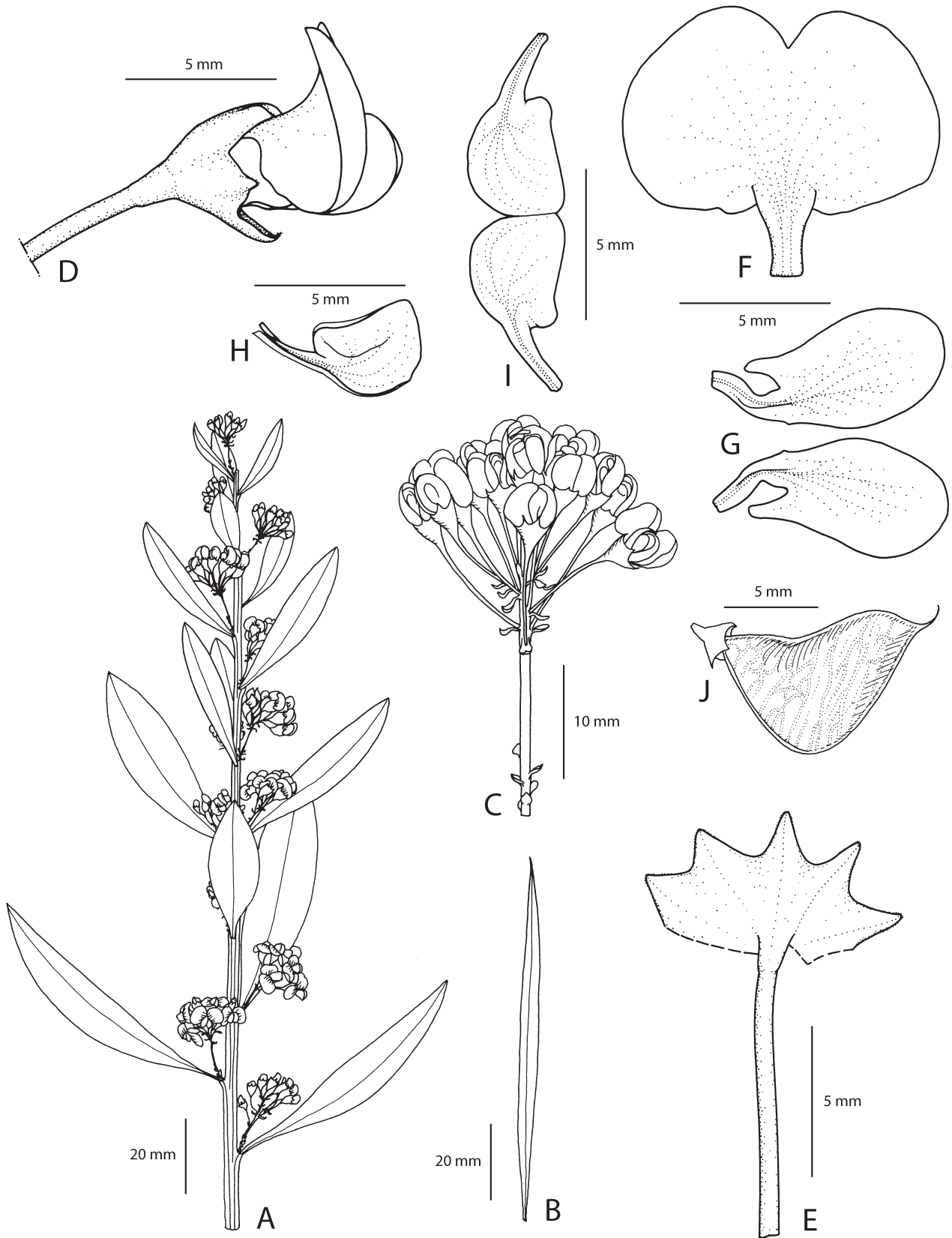
**Chromosome number:**— $n = 9$ ,  $2n = 18$  (Sands 1975).

**Common name:**—Long-leaved Bitter-pea.

**Flowering period:**—(August) September to November. *Fruiting period:* November to December.

**Distribution:**—Endemic to New South Wales, where it occurs mainly in the Sydney region, including the Blue Mountains. The full range extends from Red Head Bluff, near Newcastle, south to Ulladulla, with an outlier at Green Cape near the Victorian border.

**Habitat:**—Restricted to sandy or lateritic soil over sandstone, in dry sclerophyll forest or heath.



A. Prowse

**FIGURE 43.** *Daviesia corymbosa*. A. Flowering branchlet. B. Linear phyllode. C. Inflorescence. D. Flower, lateral view. E. Calyx opened out, upper lobes at left. F. Standard. G. Wings. H. Keel. I. Same, opened out. J. Pod. A, C–I from *Crisp 1168*; B, J from *Crisp 4688*. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Selected specimens (174 examined):**—NEW SOUTH WALES. **Central Coast:** Nepean Dam to Bargo Road, 34°17'S, 150°35'E, *E.F. Constable*, 3 December 1953 (NSW 26521); 0.5 km S of Thirlmere, 34°13'S, 150°34'E, *M.D. Crisp 4686–8*, 27 November 1978 (CBG); Waterfall, 34°08'S, 151°00'E, *H. Deane*, September 1886 (NSW 35130); Mellong Range, S of Putty, 32°58'S, 150°42'E, *L.A.S. Johnson s.n.*, 20 September 1951 (NSW 17667); Grose–Nepean Rivers, 33°36'S, 150°42'E, *J.H. Maiden s.n. & R.H. Cambage*, September 1906 (NSW 35117). **Central Tablelands:** Kings Tableland, 33°46'S, 150°23'E, *M.D. Crisp 7493, J. M. Taylor & P. H. Weston*, 29 October 1984 (CBG, MEL, NSW); 2 km N of Hill Top, 34°20'S, 150°29'E, *M.D. Crisp 7854 & P. H. Weston*, 6 November 1986 (CBG, JRAU, MEL, MEXU, MO); *ibid.*, *M.D. Crisp 7855*, 6 November 1986 (CBG, MO, NSW); Valley Heights, 33°42'S, 150°35'E, *A.A. Hamilton 2540a, b*, January 1914 (NSW); Blaxland, 33°45'S, 150°37'E, *A.A. Hamilton 240c*, June 1914 (NSW); 4.8 km E of Leumeah, 34°03'S, 150°56'E, *L.A.S. Johnson s.n.*, 6 November 1948 (NSW 35114); Berowra, 33°38'S, 151°09'E, *E. Lassak s.n.*, September 1964 (CBG 9001953); Mittagong to Penrith road, *M. Parris s.n.*, 22 November 1979 (CBG 8503700); Hazelbrook, 33°44'S, 150°27'E, *M.E. Phillips s.n.*, October 1945 (CBG 9001960, NSW); Blue Mountains, Ingar picnic area, 11 km SE of Wentworth Falls, 33°45'S, 150°25'E, *I. R. Telford 2956 & J. Pulley*, 29 September 1971 (CBG). **South Coast:** Turpentine Range, 35°05'S, 150°23'E, *M.D. Crisp 1168*, 14 September 1975 (CBG, HO, NSW); near Green Cape, 37°16'S, 150°03'E, *M.E. Phillips 110*, 8 October 1961 (CBG).

**Affinity:**—*Daviesia corymbosa* is closely related to *D. latifolia*, *D. laevis* and *D. laxiflora* but is immediately distinguished by its unit inflorescences, which are corymbose (as opposed to evenly racemose), consisting of a distinct peduncle bearing non-subtending bracts only towards the base, naked above, then terminating in a condensed rachis bearing bracts that subtend flowers (Fig.43C). Sometimes the raceme rachis is so condensed that the inflorescence appears umbelliform. *Daviesia laxiflora* also differs from *D. corymbosa* in having subulate, appressed bracts, while *D. laevis* differs in having obscure tertiary venation, and both these species and *D. latifolia* have more or less glaucous phyllodes by contrast with the green phyllodes of *D. corymbosa*.

**Hybrids:**—*Daviesia corymbosa* × *D. latifolia* (Crisp 1991a).

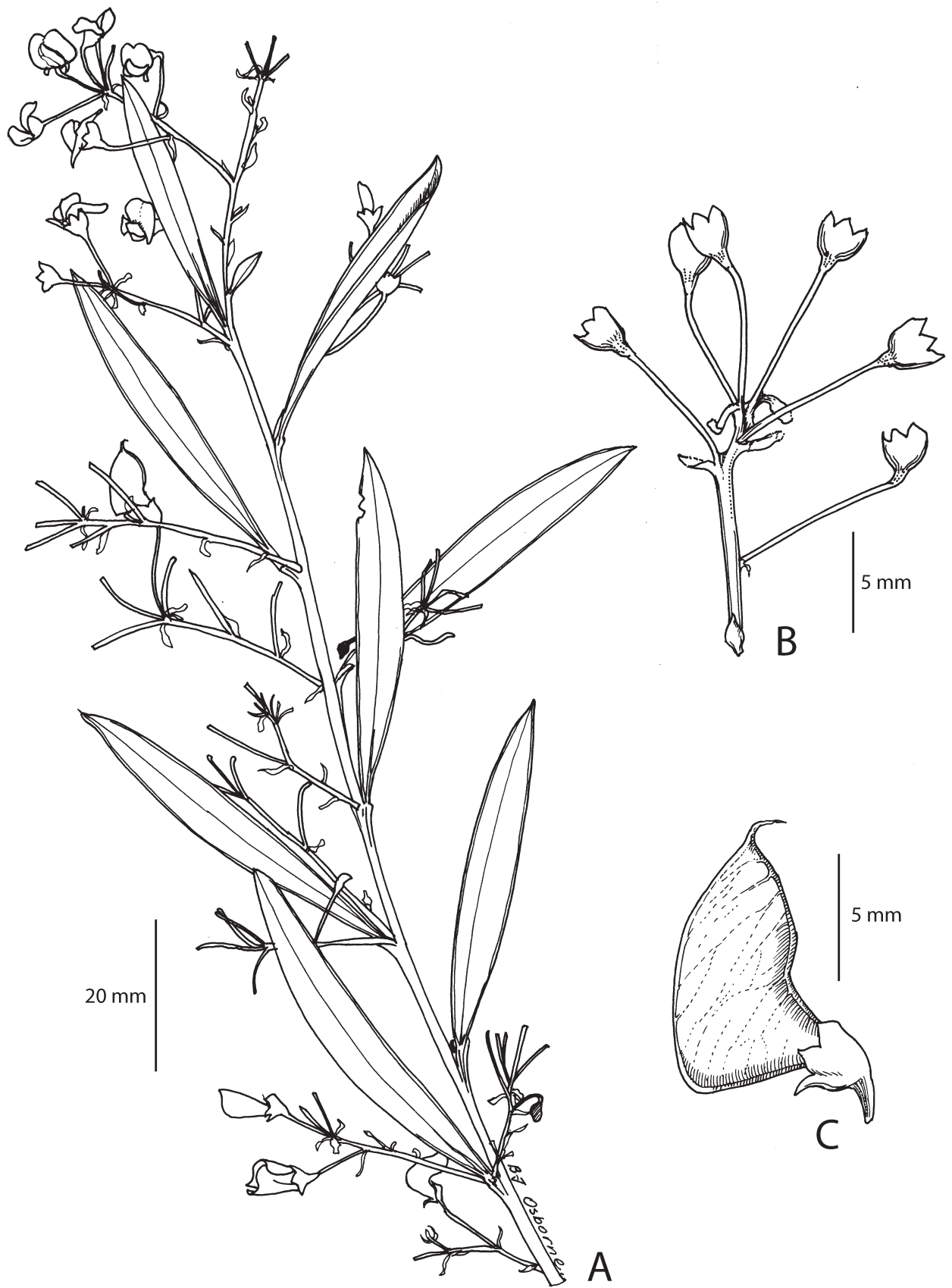
**45. *Daviesia flava*** Pedley (1977: 35), Crisp (1995: 1193). Type: Queensland, Cook, Kuranda–Mareeba road, 'Webb & Tracey 5929, 28 February 1962...' Holotype: BRI; isotypes: CANB, K

Spreading to rounded *shrubs*, to 2 m high, glabrous. *Root anatomy* unknown. *Branchlets* ascending, terete, prominently ribbed. *Phyllodes* scattered, spreading, linear or narrow-ovate to -obovate, apex acute to rounded, base cuneate with a thickened articulation, 30–130 × 2–17 mm, primary and secondary venation prominent on both abaxial and adaxial surfaces. *Unit inflorescences* racemose (rarely paniculate), solitary to several in the axils or occasionally terminal, often appearing umbel-like toward the apex, 3–10-flowered; *peduncle* 8–24 mm long; *rachis* 0.5–13 mm long; *subtending bracts* spreading to recurved, triangular near the base of the peduncle, becoming oblong distally, ca. 1.5 mm long. *Pedicel* 4.5–11 mm long. *Calyx* 3–3.5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united higher than the lower 3, ca. 1 mm long; lower 3 lobes triangular, ca. 0.75 mm long. *Corolla* entirely yellow; *standard* transversely elliptic, emarginate, auriculate, 5–6 × 5–8 mm including the ca. 1.5 mm claw; *wings* elliptic with a rounded, incurved apex, scarcely enclosing the keel, auriculate, 6–7 × 2.25–2.75 mm including the 1.5–2 mm claw; *keel* half transversely elliptic, acute, auriculate, saccate, 5–5.5 × 1.5–2.2 mm including the ca. 2 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, narrower filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader filaments and longer, oblong, basifixed, 2-celled anthers; filaments compressed, cohering. *Pod* obliquely shallowly obtriangular, acute, ± compressed, 8–10 × 5–6 mm; upper suture strongly sigmoid; lower suture acute. *Seed* oblong, ca. 3 mm long, 2–2.2 mm broad, 1 mm thick, light brown with black mottling; *aril* ca. 1 mm long. (Fig. 44).

**Flowering period:**—March to November. *Fruiting period:* May to November.

**Distribution:**—Far north Queensland, from the Laura sandstones south to the Newcastle Range and near Townsville.

**Habitat:**—Sandy soils, sometimes gravelly, on hillsides and steep rocky slopes on sandstone or granite, in open eucalypt—*Eucalyptus* and *Corymbia* K.D. Hill & Johnson (1995: 214)—forest or woodland with *Acacia* spp. and a mixed shrub understorey.



**FIGURE 44.** *Daviesia flava*. A. Flowering branchlet. B. Inflorescence with calyces representing flowers. C. Pod. A–C from *Wrigley & Telford NQ1490*. Drawn by B-J. Osborne.

**Selected specimens (25 examined):**—QUEENSLAND. **Cook:** Giant Horse Gallery, Laura, 15°40'S, 144°30'E, *B. Hyland 8121*, 9 March 1975 (BRI, CANB, QRS); Henderson Range, ca. 33 km NW of Cooktown, 0.5 km from Isabella Falls along Battle Camp Road towards Laura, 15°18'S, 145°01'E, *I.R. Telford 12054*, 8 July 1994 (BRI, CBG, MEL, NSW); 16 km from Laura towards Lakeland Downs, 15°40'S, 144°32'E, *J.W. Wrigley & I.R. Telford NQ1490*, 20 June 1972 (CBG); Cooktown Road, ca. 15°S, 125°E, *I. Olsen 392*, 13 June 1967 (BRI, CANB, NSW). **North Kennedy:** 6.5 km SW of Mt Garnet, 17°45'S, 145°00'E, *B. Hyland 5070*, 1 June 1971 (BRI, QRS); Princess Hills, Lumholtz National Park, W of Cardwell, 18°17'S, 145°20'E, *A.R. Bean 5162*, 20 October 1992 (BRI, CANB, PERTH).

**Affinity:**—*Daviesia reclinata* resembles *D. flava* in general aspect, phyllodes, inflorescence, flower (including the pure yellow corolla) and fruit morphology, and also occurs in northern Australia but farther west, in the Northern Territory and Western Australia. *Daviesia reclinata* differs in having linear phyllodes  $\leq 6$  mm broad, longer racemes (rachis 10–140 mm long) that are occasionally paniculate but not condensed and umbelliform toward the apex, larger flowers (e.g. calyx 4–5 mm long, standard  $7\text{--}8.5 \times 6\text{--}7$  mm), and the calyx is noticeably accrescent in fruit.

**46. *Daviesia suaveolens*** Crisp (1991a: 269), Crisp (1995: 1239), Crisp (2002: 524). Type: New South Wales, South Coast, Merricumbene area, *M.D. Crisp 4654*, 16 November 1978. Holotype: CBG; isotypes: AD, K, MEL, MO, NSW, PERTH

Arborescent *shrubs* or small, olive-like *trees*, to 6 m tall, glabrous. *Root anatomy* unknown. *Branchlets* ascending or arching, terete, slightly angular. *Phyllodes* scattered, erect to lax, narrowly obovate or rarely linear,  $\pm$  straight, apex obtuse or rounded, occasionally retuse, rarely acute, tapered to the obscurely articulate base,  $30\text{--}100 \times 4\text{--}17$  mm, with midrib and main lateral veins visible, dark green to glaucescent, sometimes discolorous. *Unit inflorescences* 1 or 2 per axil, condensed-racemose and appearing umbellate, 3–6-flowered; *peduncle* from almost nil to ca. 0.5 mm long; *rachis* 1–2 mm long; *barren basal bracts* appressed, overlapping and mostly concealing the inflorescence rachis; *subtending bracts* appressed, narrowly oblong, with margins incurved around pedicel and occasionally fimbriate, 1–1.5 mm long. *Flowers* very fragrant. *Pedicels* 1–3 mm long. *Calyx* 4–5 mm long including 1–1.5 mm stipe-like receptacle, pale green with a purple tinge in the sinuses, sometimes also at apices; upper 2 lobes united into a truncate, emarginate lip ca. 1.5 mm long; lower 3 lobes triangular or broadly triangular, ca. 1 mm long. *Corolla: standard* transversely broadly elliptic, emarginate, truncate or broadly cuneate at base,  $8\text{--}9 \times 9\text{--}10$  mm including 1.5–2 mm claw, pure yellow or with faint red markings surrounding an intensely yellow bilobed marking at centre; *wings* obovate, rounded and strongly incurved at apex, enclosing the keel, auriculate,  $7\text{--}8 \times 3\text{--}3.5$  mm including 2–2.5 mm claw, yellow; *keel* half very broadly obovate, scarcely acute, auriculate, saccate,  $5.5 \times 2\text{--}2.5$  mm including 2–2.5 mm claw, pale yellow or with pink infusion towards apex. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and globose, subversatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and obloid,  $\pm$  basifixed, 2-celled anthers; filaments free, about equal in length. *Pod* obliquely shallowly obtriangular, acute with a short beak, compressed,  $9\text{--}12 \times 6\text{--}7$  mm, greenish or pale brown; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, 3–3.5 mm long, 1.5–2 mm broad, 1.25 mm thick, tan with black markings; *aril* narrowly obloid, with a thick, ridged lobe, 2–2.5 mm long. (Fig. 45).

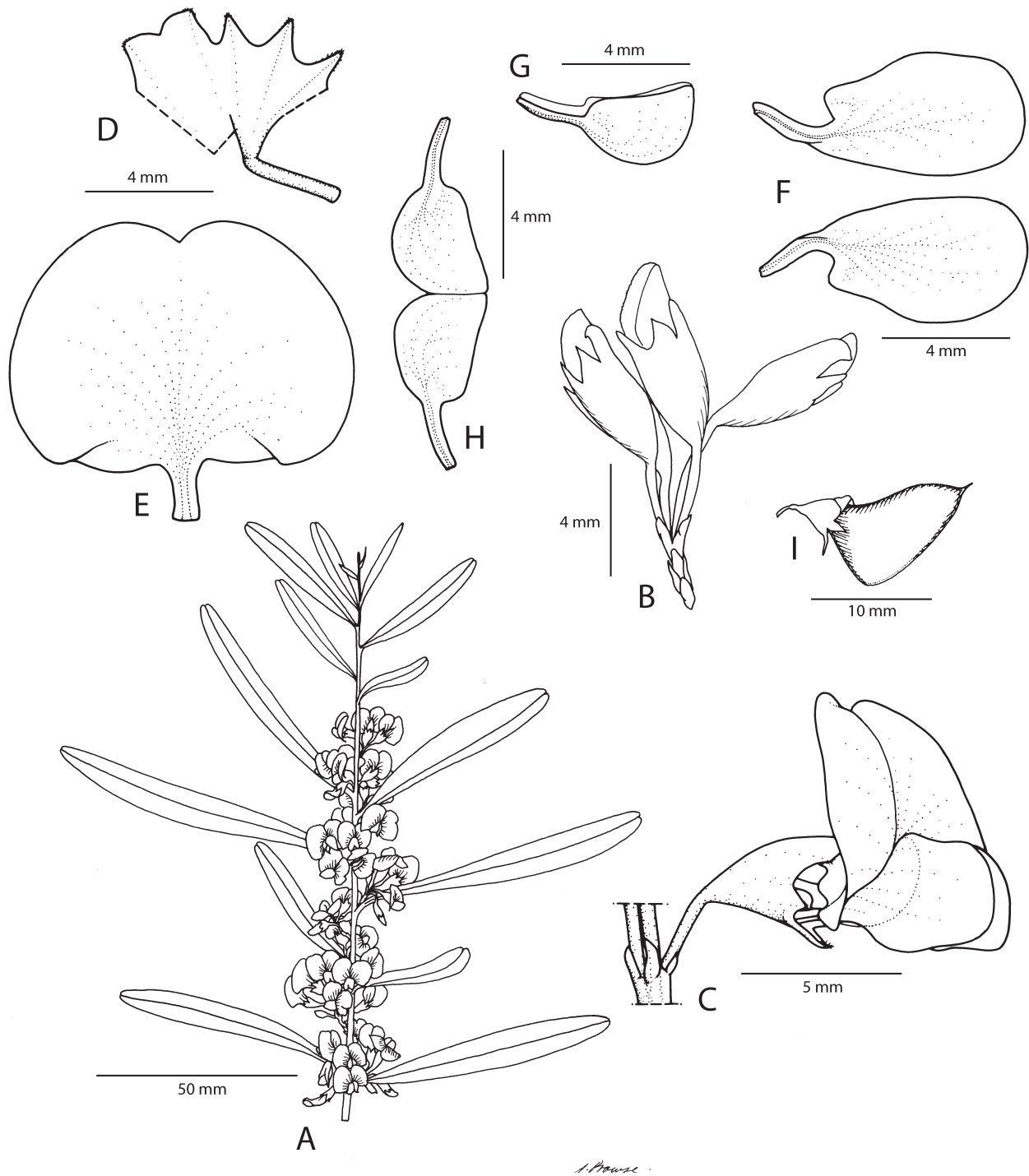
**Flowering period:**—September to November. *Fruiting period:* January and February.

**Distribution:**—Southern New South Wales, along the eastern escarpment of the tablelands, from Monga south to Bemboka.

**Habitat:**—Grows on razorback ridges and precipitous upper slopes in skeletal acidic soils, often among boulders. The sites are mostly very exposed but receive a great deal of moisture from rain and fog. Associated vegetation is usually open *Eucalyptus* forest dominated by ash species such as *E. sieberi* Johnson (1962: 125), with *Acacia* and ferns as the principal understorey elements.

**Selected specimens (27 examined):**—NEW SOUTH WALES. **Southern Tablelands:** Nelsons Creek Fire Trail, 36°31'S, 149°37'E, *G.A. Butler 1367*, 2 February 1984 (CBG); Wadbilliga Trig Trail, 36°24'S, 149°38'E, *M.D. Crisp 1247*, 30 September 1975 (AD, BISH, CBG, MEL, NSW); 9 km ESE of Araluen, 35°41'S, 149°54'E, *M.D. Crisp 2308*, 16 November 1976 (AD, BISH, CBG, K, L, MEL, NSW, PERTH); near Dampier Trig, 36°02'S, 149°40'E, *M.D. Crisp 2387*, 1 December 1976 (AD, BRI, CBG, NSW, PERTH, US); 11.5 km S of Monga, 35°41'S, 149°54'E, *M.D. Crisp 2434 & L.D. Williams*, 13 January 1977 (AD, CBG, MEL, NSW); 8.2 km NNW of

Mt Donovan, 35°47'S, 149°52'E, *M.D. Crisp 4660*, 16 November 1978 (CBG, NSW); 10 km NNE of Bemboka, 36°33'S, 149°35'E, *I.R. Telford 8897*, 12 January 1983 (CBG); 24 km SSE of Braidwood, 35°38'S, 149°53'E, *M.D. Crisp 7190 & G.A. Butler*, 1 December 1983 (CBG, MEL, MO); 11 km S of Monga, 35°41'S, 149°54'E, *J. M. Taylor 2638 & I.R. Telford*, 1 November 1989 (CBG, HO, MEL, NSW).



**FIGURE 45.** *Daviesia suaveolens*. A. Flowering branchlet. B. Inflorescence. C. Flower with subtending bract. D. Calyx opened out, upper lobes at left. E. Standard. F. Wings. G. Keel. H. Same, opened out. I. Pod. A from *Crisp 4654* (type); B, I from *Crisp 1247*; C–H from *Crisp 2308*. Drawn by A.L. Prowse. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Affinity:**—*Daviesia suaveolens* shows an obvious relationship to the widespread and variable *D. mimosoides*

but can be distinguished by several characters taken together. The characteristic sweet smell of the flowers of *D. suaveolens* differentiates it from *D. mimosoides*. This odour is so strong that it permeates the forest when plants of *D. suaveolens* are flowering. In *D. mimosoides*, the flowers have a fainter odour that is not especially pleasant. However, these odours are lost from pressed and dried specimens.

The calyx of *D. suaveolens* is longer and narrower than that of *D. mimosoides*. Its lower 3 lobes are triangular or broadly triangular (length: breadth > 1) and 0.8–1 mm long, whereas in *D. mimosoides* they are shallowly to very shallowly triangular (length: breadth < 0.6) and 0.3–0.6 mm long. In addition, the lower 3 calyx lobes of *D. mimosoides* are markedly thickened and tinged with dark brown at the apices whereas those of *D. suaveolens* are uniform in thickness and colour. Some differences can also be perceived between the inflorescences of these two species. In *D. suaveolens*, the inflorescence is small, compact and subumbelliform, with three to six flowers and a short rachis (1–2 mm long) that is mostly concealed by the overlapping bracts. The inflorescence of *D. mimosoides* is usually more diffuse, being corymbiform, and has five to ten flowers and a longer rachis (3–15 mm long) with well-spaced bracts. Partial exceptions to this distinction are some specimens of *D. mimosoides* from higher elevations in southern New South Wales and eastern Victoria in which the inflorescence is condensed like that of *D. suaveolens*. However, the number of flowers per inflorescence is high (6 or more) as in typical *D. mimosoides*. Other distinctions between *D. suaveolens* and *D. mimosoides* are found in the habit and the colour of the petals. Mature plants of *D. suaveolens* are small trees up to 6 m tall, resembling olive trees when open-grown. This species is among the tallest in the genus, exceeded only by *D. arborea* and *D. laxiflora*. By contrast, plants of *D. mimosoides* are usually multi-stemmed shrubs less than 3 m tall, though young or exposed plants of *D. suaveolens* are shrubby and plants of *D. mimosoides* in a few localities are arborescent. The petals of *D. suaveolens* are pure yellow with faint red markings at the centre of the standard. By contrast, the standard of *D. mimosoides* is orange-yellow at the edges with a conspicuous dark red marking towards the centre and the wings are mostly dark red.

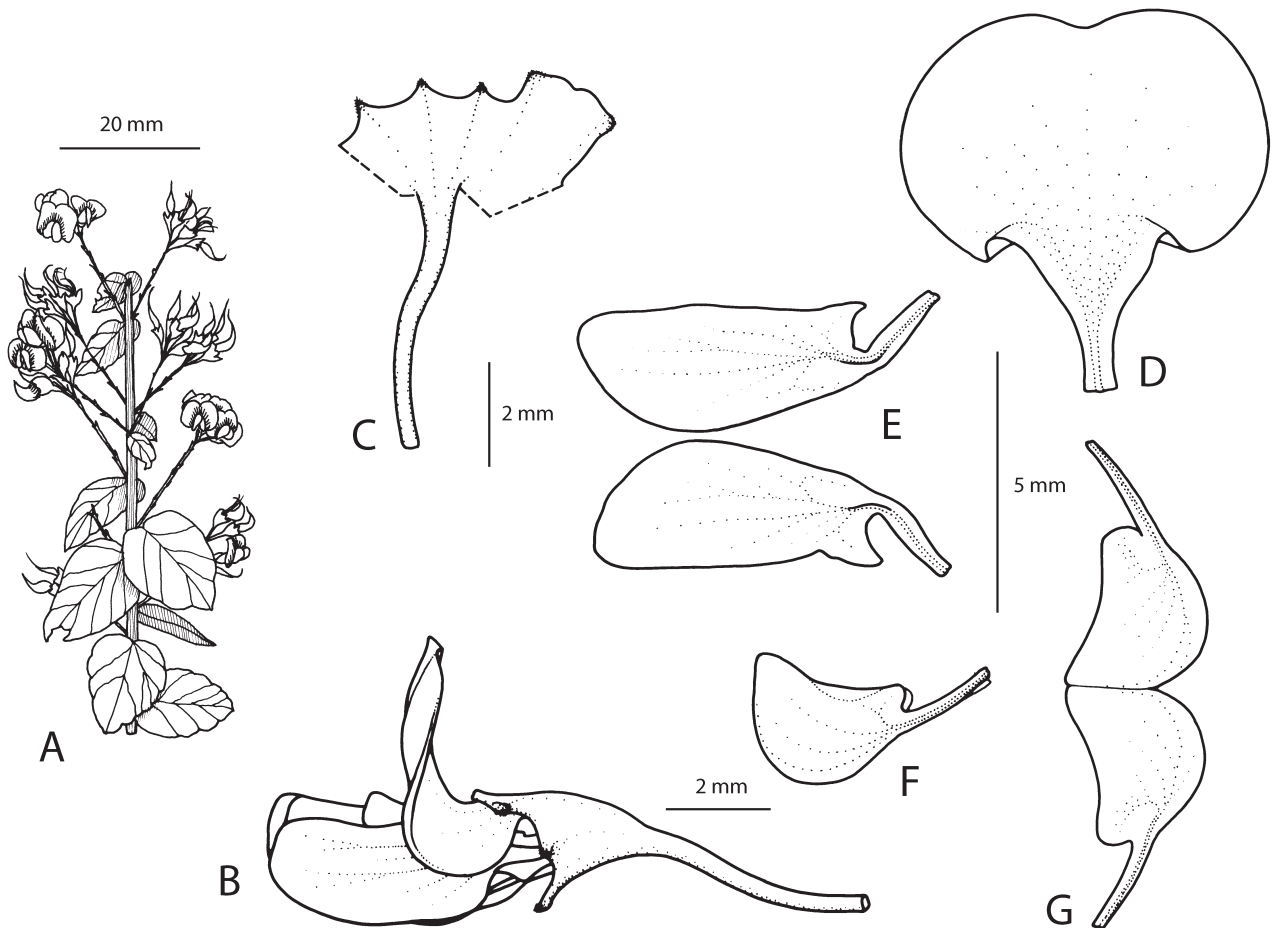
Populations of *D. mimosoides* and *D. suaveolens* grow in close proximity apparently without interbreeding. In general, *D. suaveolens* occurs on sites that experience higher rainfall and are more exposed, rockier and better drained than those where *D. mimosoides* is found.

**47. *Daviesia buxifolia*** Bentham (1864: 75), Crisp (1991a: 277), Crisp (1995: 1179), Jeanes (1996: 759), (Crisp 2002: 525). *Daviesia latifolia* Brown (1811: 20) var. *buxifolia* (Benth.) Moore & Betche (1893: 133). Type: 'N. S. Wales. Between Wombin river & False Bay, *Mossman*. Victoria. Avon Ranges, Macalister & Genoa rivers, *F. Mueller*. W. Australia 'King George's Sound' (probably to the eastward), *Baxter*.' Lectotype (Crisp 1991a: 277): Avon Ranges, *F. Mueller s.n.* (K—sheet ex Herb. Hooker, annotated 'Negative No. Kew 919'); isolectotype: K (sheet ex Herb. Linnean Society), LD, MEL 77794, 77796, 77798 & 77799. Syntype: Wombin [Wonboyn] River–False Bay, *S. Mossman* 236, 1850 (K—sheet ex Herb. Benth.); isosyntypes: BRI, CGE, E, FI, FI-W (2 sheets), K (sheet of uncertain origin but not seen by Bentham), P. Syntype: Avon River, also common on the Genoa River, *F. Mueller s.n.* (MEL 77795); isosyntypes: BM, MEL 77800, NSW. Syntype: Ranges on the McAllister River, *F. Mueller s.n.* (K); isosyntypes: MEL 77797, W. Two further syntypes appear to be intermediate between *D. buxifolia* and *D. mimosoides*. These are: K.G. Sound, *Baxter s.n.* (K) [locality apparently mistaken] and Avon River, *F. Mueller s.n.* (MEL 79004)

[*Daviesia latifolia* auct. non R.Br.: Mueller (1888: 203)]

Glabrous shrubs, 0.5–2 m high; crown usually open with graceful, somewhat weeping branches, occasionally more compact and bushy, glabrous. *Root anatomy* unknown. *Branchlets* ascending or spreading, angular-terete, ribbed. *Phyllodes* often crowded, spreading to reclinate, ovate, broadly so or orbicular, undulate, apically rounded, obtuse or rarely acute, marginally crenulate, basally cordate or truncate, articulate, 3–30(–40) × 3–21 mm, with slightly raised pinnate venation, glossy, bright to dark green. *Juvenile phyllodes* similar to adults but thinner and slightly larger (to 37 × 27 mm). *Unit inflorescences* 1(2) per axil, subcorymbose, 4–7-flowered; *peduncle* 5–10 mm long; *rachis* 3–15 mm long; *subtending bracts* appressed to pedicels, narrowly oblong, fimbriate at apex, with incurved margins, 0.75–1 mm long, red-brown. *Pedicels* 2–6 mm long. *Calyx* 3.25–5 mm long including the 1–1.5 mm stipe-like receptacle to which it is contracted; upper 2 lobes united in a truncate or obtuse, scarcely notched lip, ca. 1 mm long; lower 3 lobes shallowly triangular, thickened and darkened at apices, ca. 0.5 mm long. *Corolla: standard* strongly reflexed, very broadly obovate, obcordate, cuneate at base, ca. 6.5 × 6.5 mm including the 2 mm

claw, yellow or orange-yellow with maroon-brown markings surrounding an intensely yellow bilobed centre; *wings* obovate or narrow-obovate to -elliptic, incurved at apex but not enclosing the keel, auriculate, 5.5–6.75 × 1.75–2.25 mm including the ca. 2 mm claw, maroon-brown centrally with orange to yellow margins and tips; *keel* half very broadly obovate, falcate, subacute, saccate, auriculate, ca. 4 × 2 mm including the 1.5 mm claw, maroon-brown with yellowish tip. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and subversatile, discoid anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and oblong, basifixed, 2-celled anthers; filaments compressed, free. *Pod* obliquely shallowly obtriangular, rarely crescentic, acute to obtuse, compressed, 6–7(–9) × (4)5–6 mm, smooth or faintly reticulate, glossy red-brown; upper suture sigmoid; lower suture acute but broadly to sharply curved. *Seed* obloid, ca. 3.5 mm long, ca. 2 mm broad, ca. 1 mm thick, glossy, dark brown mottled with black; *aril* narrowly oblong, ca. 1.5 mm long. (Fig. 46).



**FIGURE 46.** *Daviesia buxifolia*. A. Flowering branchlet. B. Flower in lateral view. C. Calyx opened out, upper lip at right. D. Standard. E. Wings. F. Keel. G. Same, opened out. A from *Crisp 4621*; B–G from *Crisp 3475*. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Common name:**—Box-leaf Bitter-pea.

**Flowering period:**—October and November. *Fruiting period:* Probably November and December.

**Distribution:**—Occurs on the south coast of New South Wales between Eden and the Victorian border, with an isolated more northerly occurrence in the Tuross River valley; and in Victoria, in east Gippsland (Cann River valley), central Gippsland (between the Tambo and Macalister River valleys) and in the north-eastern highlands at Mitta Mitta and near Myrtleford.

**Habitat:**—*Daviesia buxifolia* generally occurs in mountainous terrain where it may occupy ridges, slopes or valley floors. Soils are usually skeletal and clayey, although the species has been observed on granitic sand. Associated vegetation is usually open forest dominated by *Eucalyptus* species, especially stringybarks and ashes. The understorey of the forest habitat consists of sclerophyll shrubs.

**Selected specimens (77 examined):**—**NEW SOUTH WALES. South Coast:** Near Green Cape Lighthouse,



37°11'S, 149°55'E, *M.D. Crisp 1914*, 25 January 1976 (CBG, NSW, PERTH); 30 km SW of Eden, 37°16'S, 149°41'E, *M.D. Crisp 3475*, 25 October 1977 (CBG, MEL, NSW); Towamba, toward Eden, 37°06'S, 149°49'E, *M.D. Crisp 4618–23* & *I. R. Telford*, 3 November 1978 (CBG); Tumbledown Mountain, Nadgee, 37°21'S, 149°56'E, *P. Gilmour N47*, 6 October 1982 (CBG); Wonboyn Lake, Nadgee, 37°16'S, 149°56'E, *M.E. Phillips 142*, 9 October 1961 (CBG); 26 km N of Cobargo, 36°09'S, 149°52'E, *A. & C. Tyrrel 166*, 3 October 1978 (CBG). **VICTORIA. Gippsland:** Mitta Mitta, 36°32'S, 147°22'E, *S.F. Clinton 210*, 26 October 1919 (MEL); near Bullumwaal, 37°39'S, 147°32'E, *A.C. Corrick s.n.*, 8 October 1977 (MEL 526801); Dargo Road, 37°40'S, 147°12'E, *M.G. Corrick 6158*, 11 November 1978 (CBG, MEL). **Eastern Highlands:** 15 km S of Beechworth, 36°29'S, 146°39'E, *M.D. Crisp 7102*, 27 February 1983 (CBG, MEL); 7.5 km SE of Licola, 37°41'S, 147°40'E, *P.K. Gullan 350* & *V.B. Turner*, 21 June 1978 (MEL); Taylors Gap, 36°29'S, 146°39'E, *R.K. Rowe s.n.*, 3 December 1972 (MEL 77806).

**Affinity:**—*Daviesia buxifolia* is closely related to *D. elliptica* and *D. mimosoides*. These species have essentially similar inflorescences, flowers and fruits. However, *D. buxifolia* is well distinguished from most forms of *D. mimosoides* by its phyllodes, which are ovate to orbicular, undulate, cordate or truncate at the base, crenulate at the margins, and glossy bright or dark green. In *D. mimosoides*, the phyllodes are usually narrowly elliptic, tapered to the base, entire or obscurely crenulate and dull green to glaucescent. *Daviesia elliptica* is the sister-taxon of *D. buxifolia* and is very similar. It differs from *D. mimosoides* in having phyllodes which are elliptic, obscurely crenulate, with bases rounded to cuneate, never cordate.

**Economic properties:**—A note attached to a specimen of *D. buxifolia* from Gippsland states that the plant is called 'Hop-bush' and is 'said to be eaten by cattle' (Gippsland, *R. Millard 9* [?], 8 Aug 1900, NSW 35257).

**Hybrids:**—*Daviesia buxifolia* × *D. latifolia*, *D. buxifolia* × *D. mimosoides* (Crisp 1991a).

**48. *Daviesia mimosoides*** Brown (1811: 20), Thompson (1961: 35), Stanley & Ross (1983: 253), Crisp (1991a: 271), Crisp (1995: 1213), Jeanes (1996: 759), Crisp (2002: 524). *Daviesia glauca* Loddiges (1817: t. 43), *nom. superfl. & illeg.* (*D. mimosoides* is given as a synonym). *Daviesia laurifolia* Link (1821: 403), *nom. superfl. & illeg.* (given as a synonym of *D. glauca*). *Daviesia corymbosa* Smith (1805: 507) *var. mimosoides* (R.Br.) Benth (1864: 77). Type: 'Nat. of New South Wales. Robert Brown, Esq. Introd. 1809, by Thomas Gibbs.' Lectotype (Crisp 1991a: 271): Port Jackson, between Green Hills and Parramatta, *R. Brown s.n.*, 1802–5 (BM—sheet with printed blue label, annotated by MDC as 'holotype' on 15 Jan 1982); isolectotype: BM (sheet annotated by Crisp as '?isotype'), E, K, MEL, NSW

[*Daviesia corymbosa* auct. non Sm.: Mueller (1888: 203), Moore & Betche (1893: 133)]

Usually multi-stemmed, open-crowned *shrubs*, (0.5–)1–2 m tall, rarely arborescent, to 5 m, glabrous. *Root anatomy* unknown. *Branchlets* ascending to effuse, angular-terete. *Phyllodes* scattered, erect, spreading or rarely reflexed, most commonly narrowly elliptic, less often linear, obovate or narrowly so, acute to rarely rounded at the apex, flat or rarely undulate, entire or rarely crenulate, tapered or rarely cuneate at the articulate base, 15–200 × 4–30 mm, penninerved, with venation slightly raised or obscure, coriaceous to rather thin, dull and mostly pale green to glaucescent. *Unit inflorescences* 1 or 2 (3) per axil, racemose, 5–10-flowered, usually corymbiform; *peduncle* 1–5 mm long; *rachis* (2–)4–12 mm long; *bracts* usually well spaced, rarely imbricate; *subtending bracts* appressed to pedicels, narrowly oblong, with strongly incurved margins, 0.75–2 mm long. *Pedicels* 1–9 mm long. *Calyx* 2.5–5 mm long including the 1–2 mm receptacle to which it is constricted at the base; upper 2 lobes united in a truncate or obtuse, entire or scarcely emarginate lip, 0.4–1.2 mm long, rarely more deeply divided; lower 3 lobes equal, shallowly to very shallowly triangular, thickened and tinged with dark red-brown at the apex, 0.3–0.6 mm long. *Corolla: standard* transversely broadly elliptic or very broadly ovate, obcordate, broadly cuneate to slightly cordate at the base, 6–7.5 × 5.5–8 mm including the 1–2 mm claw, (orange-) yellow with dark brownish-red or maroon infusion towards the centre and a central intense yellow bilobed marking; *wings* obovate, oblong or narrowly so, rounded and incurved at the apex, auriculate, 5–6.75 × 1.75–2.75 mm including the 1.5–2 mm claw, dark brownish-red or maroon grading to yellow at the apex and margins; *keel* half very broadly obovate to depressed-obovate, ± acute, auriculate, slightly saccate, 4–4.5 × 1.5–2 mm including the 1.5–1.75 mm claw, maroon; dark red markings rarely almost absent from petals. *Stamens* strongly dimorphic: inner whorl of 5 with terete filaments and round, ± versatile, anthers with confluent thecae; outer whorl of 5 with compressed filaments and compressed obloid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly to very broadly obtriangular, obtuse to broadly

acute, strongly compressed, 6–10 × 4–7 mm, dull red when immature, straw-coloured when ripe, rarely lead-grey; upper suture sigmoid; lower suture acute. *Seed* compressed ellipsoid, 2.5–3 mm long, 1.5–2 mm broad, 1 mm thick, brown with black mottling; *aril* obloid, with a thickly ridged lobe, 1–2 mm long. (Fig. 47, 48).

**Chromosome number:**— $n = 9$ ,  $2n = 18$  (Sands 1975).

**Common name:**—Leafy Bitter-pea.

**Flowering period:**—Mainly September and October but commencing as early as August on the coast and finishing as late as December at high elevations in the south. *Fruiting period:* October to January, the period also varying with elevation and latitude.

**Distribution:**—Extending patchily from near Maroochydore on the Sunshine Coast of Queensland, southward through the coast and tablelands of New South Wales to the eastern highlands of Victoria, as far west as Mt Tamboritha (in the highlands east of Melbourne). Isolated populations occur on the plains on the inland side of the Great Dividing Range near Mulwala on the Murray River in New South Wales and between the Broken and Ovens Rivers in Victoria. Records from farther east are likely to be misidentifications of either *D. leptophylla* or *D. laevis*.

**Habitat:**—This widespread and variable species occupies a variety of habitats. The elevation range is from sea level to nearly 1500 m and the mean annual precipitation varies from 500 to > 1500 mm. The soils are usually light or skeletal and acidic. The vegetation is most commonly open forest dominated by various *Eucalyptus* spp. with an understorey of sclerophyll shrubs. Near to the coast and on high mountains, it occurs in heath. *Daviesia mimosoides* is an extremely common shrub in the Southern Tablelands of New South Wales and the Australian Capital Territory, so much so that it dominates much of the understorey of the montane forests. Plants regenerate freely from seed after fire.

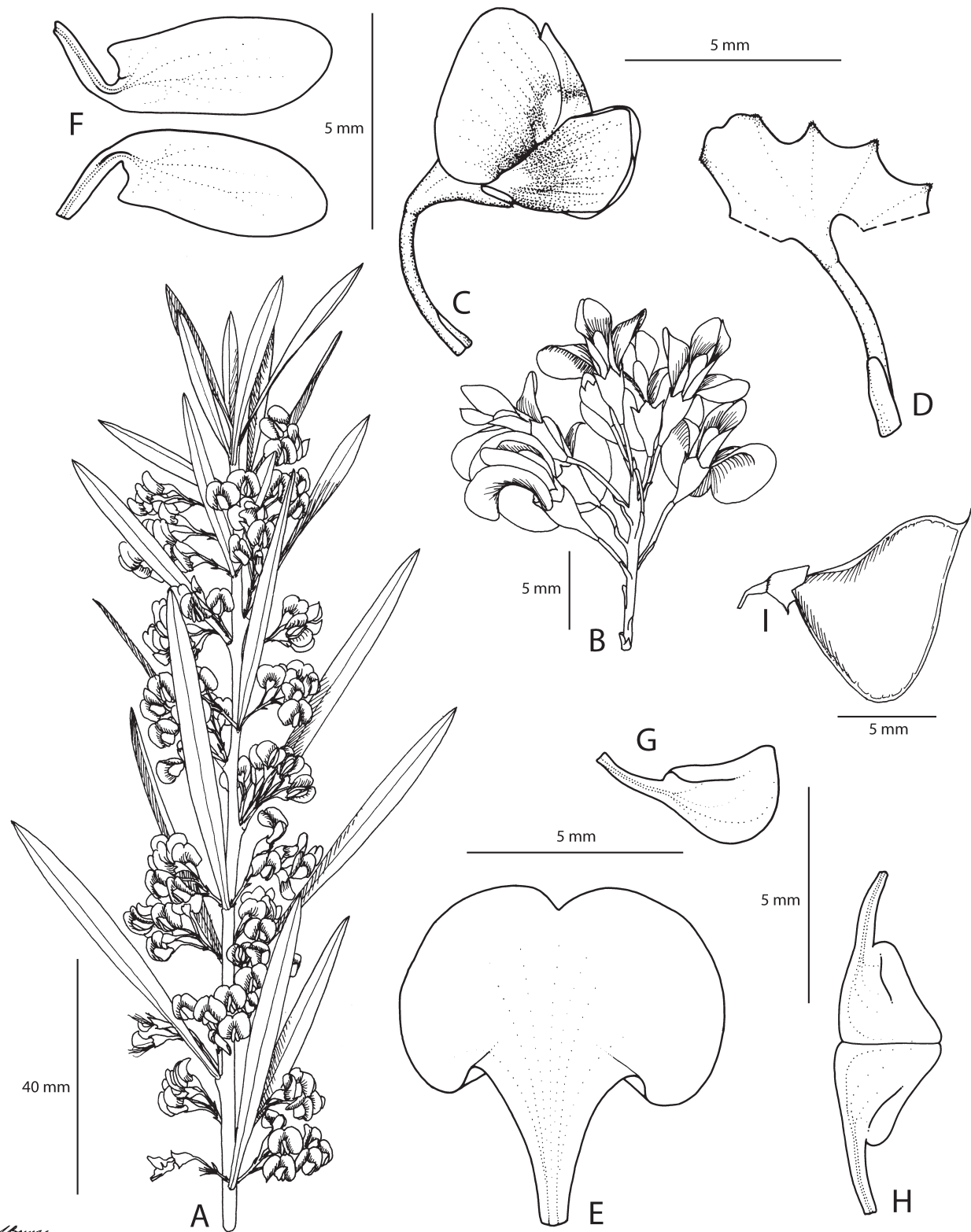
**Affinity:**—*Daviesia mimosoides* is closely related to *D. arborea*, *D. buxifolia*, *D. corymbosa*, *D. discolor*, *D. elliptica*, *D. laxiflora*, *D. laevis*, *D. leptophylla* and *D. suaveolens* (Fig. 1A). All these species have leaf-like phyllodes and more or less racemose inflorescences and occur in eastern Australia.

Previously, *D. mimosoides* was either confused with *D. corymbosa* or placed as a variety under that species (Thompson 1961). In fact, *D. corymbosa* is not very closely related to *D. mimosoides* (Fig. 1A) and can be readily distinguished by its inflorescence, bracts and leaf venation. The inflorescence of *D. corymbosa* is strongly corymbose, sometimes umbelliform, with the pedicels crowded along the upper few millimetres of the rachis. Below the lowest pedicel, the rachis usually has a naked central portion and below this again barren bracts are scattered down to the base. The rachis is mostly longer (10–40 mm) and more robust than in *D. mimosoides*. The bracts spread or reflex from the rachis and are broader than in *D. mimosoides*, being broadly elliptic in shape. The phyllode venation of *D. corymbosa* is prominently raised and reticulate, by contrast with the less conspicuous, pinnate venation of *D. mimosoides*.

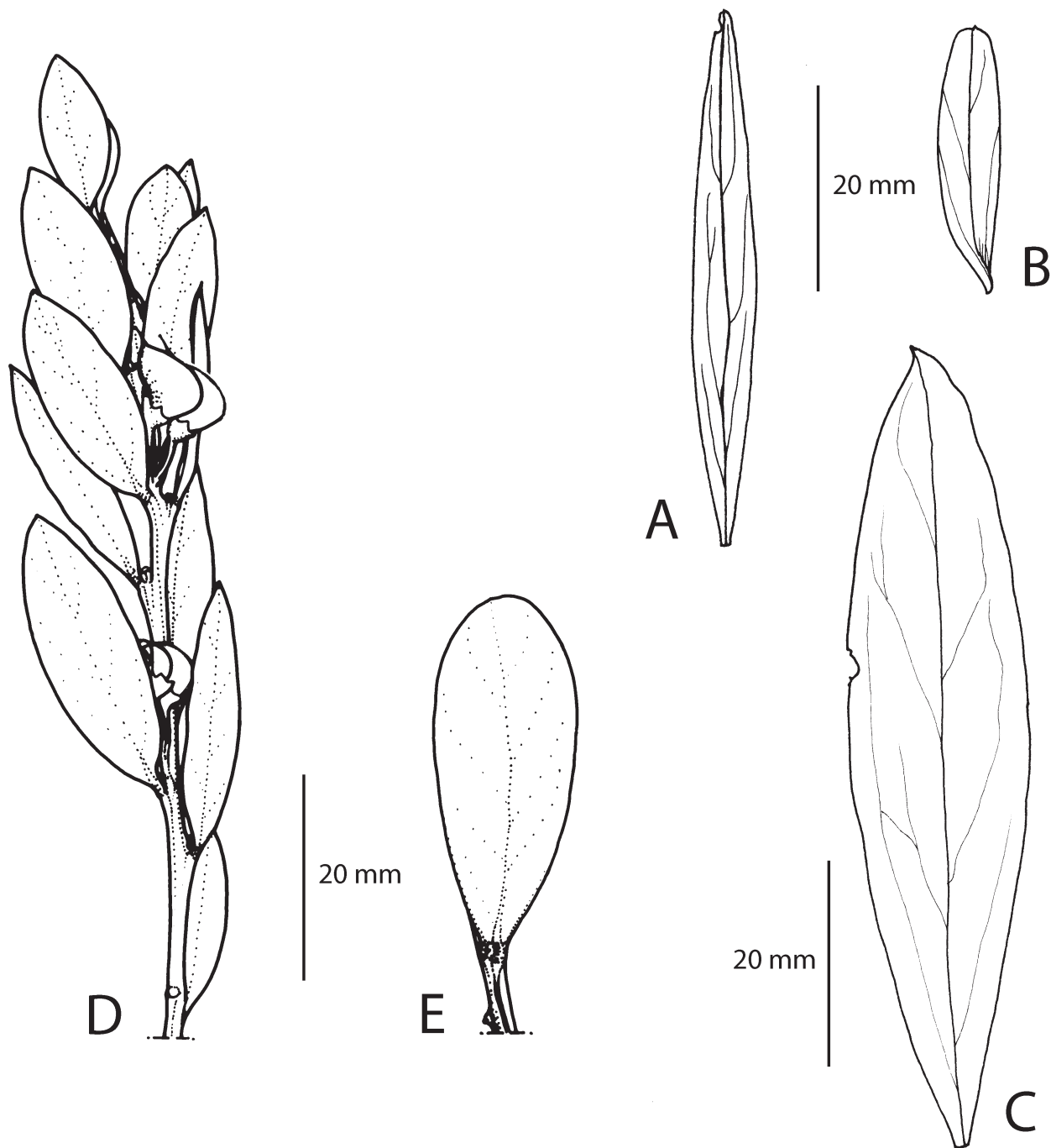
*Daviesia suaveolens* is very similar to *D. mimosoides* but differs in having strongly fragrant, mostly pure yellow flowers and longer (ca. 1 mm long), narrower calyx lobes which are uniform in thickness and usually uniform in colour. In *D. leptophylla*, the phyllodes have at least 2 raised longitudinal veins and slightly recurved margins, and are nearly always linear.

Both *D. buxifolia* and *D. elliptica* differ from *D. mimosoides* in having phyllodes with crenulate margins (sometimes obscurely so) and a glossy green surface, and the base of the phyllode is cordate, rounded or cuneate; also the peduncles are usually longer in these 2 species (3.5–15 mm long). Intermediates between *D. mimosoides* and *D. buxifolia* or *D. elliptica* have been recorded in a few places (see the section on hybrids at the end of Crisp 1991a). *Daviesia arborea* and *D. discolor* both differ from *D. mimosoides* in their thin, parallel-veined, discoloured phyllodes and in their calyx lobes which are uniform in thickness and colour. *Daviesia laevis* and *D. laxiflora* differ from *D. mimosoides* in having inflorescences that are long and evenly racemose from the base; in *D. laevis* the rachis is 20–30(–80) mm long and in *D. laxiflora* it is 50–100 mm long.

**Hybrids:**—*Daviesia buxifolia* × *D. mimosoides*, *D. elliptica* × *D. mimosoides*, *D. elliptica* × *D. latifolia* × *D. mimosoides*, *D. latifolia* × *D. mimosoides*, *D. leptophylla* × *D. mimosoides*. Hybrids between *D. leptophylla* and *D. mimosoides* occur on the Southern Tablelands of New South Wales where the species come into contact (Crisp 1991a).



**FIGURE 47.** *Daviesia mimosoides* subsp. *mimosoides*. A. Flowering branchlet. B. Inflorescence. C. Flower with subtending bract. D. Calyx opened out, upper lip at left. E. Standard. F. Wings. G. Keel. H. Same, opened out. I. Pod. A–H from *Crisp 6795*; I from *Evans & Blaxell s.n.* (NSW 46156). Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.



**FIGURE 48.** *Daviesia mimosoides*, comparing phyllode variation in the two subspecies. A–C. *Daviesia mimosoides* subsp. *mimosoides* (A, B from Brown *s.n.*, 1802–5, holotype, BM; C from Crisp 1329). D, E. *Daviesia mimosoides* subsp. *acris* (D from Beauglehole 35741; E from Crisp 1910). Drawn by A.L. Prowse. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**48a. *Daviesia mimosoides* Brown (1811: 20) subsp. *mimosoides***

References: Crisp (1991a: 275), Crisp (1995: 1213), Crisp (2002: 525), Jeanes (1996: 760).

[*Daviesia corymbosa* auct. non Smith (1805: 507): Andrews (1810: t. 611), Mueller (1888: 203), Moore & Betche (1893: 133)]

*Phyllodes* narrowly elliptic to narrowly obovate or linear, apically acute or obtuse, tapered to base, not crenulate, dull green to glaucescent. (Figs 47, 48A–C).

**Distribution and Habitat:**—As for the species, excluding rocky sites at the higher elevations.

**Economic value:**—Notes attached to a specimen from the south coast of New South Wales suggest that *D. mimosoides* subsp. *mimosoides* may be useful as browse for stock during drought (Yowrie, east of Cobargo, *J.S. Allan s.n.*, 4 Feb 1897, NSW 35293). The collector stated that the plant was ‘eaten by cattle and horses, during the last dry season, [I] was informed that stock eat it ravenously, and that it kept them alive. It has a very bitter taste’.

**Selected specimens (296 examined):**—**QUEENSLAND. Moreton:** Maroochie, 26°39’S, 153°06’E, *F.M. Bailey s.n.* (MEL 72486); Commera, 27°52’S, 153°19’E, *O. Blake s.n.*, 13 September 1975 (BRI AQ0461180). **NEW SOUTH WALES. North Coast:** Gloucester Buckets, 32°01’S, 151°56’E, *J.H. Maiden*, September 1897 (CANB 8408052, NSW 35272). **Central Coast:** Menangle Park, 34°06’S, 150°44’E, *W. Bishop & T. James 836*, 4 September 1985 (CANB, NSW); Kurnell Reserve, 34°00’S, 151°13’E, *O.D. Evans & D.F. Blaxell*, 23 October 1958 (NSW 46156). **South Coast:** 2.5 km SW of Nelligen, 35°39’S, 150°07’E, *M.D. Crisp 1323*, 15 October 1975 (CBG, MEL, NSW, PERTH). **Central Tablelands:** Lees Pinch, 32°19’S, 150°02’E, *M.D. Crisp 2289 et al.*, 28 October 1976 (CBG); 37 km SW of Katoomba, 33°55’S, 150°00’E, *M.D. Crisp 4020a*, 13 May 1978 (CBG). **Southern Tablelands:** 4 km S of Nimmitabel, 36°33’S, 149°18’E, *M.D. Crisp 1937*, 26 January 1976 (CBG, DNA); 15 km SW of Nerringundah, 36°11’S, 149°49’E, *M.D. Crisp 2173*, 23 September 1976 (CBG); Endrick River, SE of bridge, 35°05’S, 150°07’E, *M.D. Crisp 2299*, 18 November 1976 (AD, BISH, BRI, CBG, K, NSW); *ibid.*, *M.D. Crisp 2300* (CBG, NSW, PERTH). **Central-west Slopes:** N of Cassilis, 31°43’S, 150°02’E, *G. Burrows s.n.*, October 1918 (NSW 35267). **South Far West Plains:** Mulwala, 35°59’S, 146°00’E, *J.J. Fletcher s.n.*, October 1890 (CBG 8405858, NSW 35264). **AUSTRALIAN CAPITAL TERRITORY.** Black Mountain, Canberra, 35°17’S, 149°07’E, *M.D. Crisp 1266*, 2 October 1975 (AD, CBG); 2 km S of Bulls Head, 35°24’S, 148°48’E, *M.D. Crisp 1329*, 9 November 1975 (CBG, MEL); Capital Hill, Canberra, 35°19’S, 149°08’E, *M.D. Crisp 4695*, 19 December 1978 (CBG); Black Mountain, Canberra, 35°17’S, 149°06’E, *M.D. Crisp 6795*, 21 January 1980 (CBG, NSW). **VICTORIA. Northern Plains:** Broken–Ovens Rivers, *F. Mueller s.n.* (MEL 79003—right hand specimen only). **Eastern Highlands:** 9 km NE of Mt Nunniong, 37°03’S, 148°07’E, *J.H. Willis s.n.*, 13 November 1964 (MEL 502512).

**48b. *Daviesia mimosoides*** Brown (1811: 20) subsp. *acris* Crisp (1991a: 276), Jeanes (1996: 760), Crisp (2002: 525). Type: Australian Capital Territory, Brindabella Range, summit of Mt Coree, 35°18’S, 148°48’E, 1420 m elev., *M.D. Crisp 1909*, 18 January 1976. Holotype: CBG; isotypes: AD, NSW

*Phyllodes* obovate or elliptic, scarcely narrow, rounded or obtuse at apex, occasionally acute, obscurely crenate, basally cuneate, glaucescent. (Fig. 48D, E).

**Distribution:**—Subsp. *acris* occurs in the Southern Tablelands of New South Wales, the Australian Capital Territory and the eastern highlands of Victoria.

**Habitat:**—This subspecies is restricted to rocky peaks and ridges above 1200 m elevation. Associated vegetation includes sclerophyll forest but is more usually sparse shrubberies. Although appearing to be an altitudinal cline-form of subsp. *mimosoides* (above), the rocky substrate and exposed topography seem to be equally important in delimiting the niche of subsp. *acris*. Populations of subsp. *mimosoides* occur at similar elevations on more favourable sites e.g. on the upper slopes of the Brindabella Range.

**Conservation status:**—National: Not listed. Vic.: Rare in Victoria but not considered otherwise threatened—the subspecies occurs more extensively in NSW.

**Selected specimens (21 examined):**—**NEW SOUTH WALES. Southern Tablelands:** Mt Jillamatong, 35°23’S, 149°46’E, *J.L. Boorman s.n.*, February 1909 (NSW 35287); Happy Jacks Dam, 36°00’S, 148°26’E, *M.E. Phillips 899*, 15 December 1960 (AD, CBG). **AUSTRALIAN CAPITAL TERRITORY.** Summit of Mt Coree, 35°18’S, 148°49’E, *M.D. Crisp 1908–1911*, 18 January 1976 (AD, BRI, CBG, HO, NSW, NT, PERTH). **VICTORIA. Eastern Highlands:** Gap Road, near Delegate River, 37°13’S, 148°50’E, *A.C. Beaglehole 34685* (MEL); Mt Tingaringy, 37°00’S, 148°41’E, *A.C. Beaglehole 35741*, 2 January 1971 (MEL); N side of Mt Livingstone, 37°09’S, 147°33’E, *J. Stirling 13*, 21 October 1882 (MEL); summit of Mt Tingaringy, 37°00’S, 148°41’E, *J.H. Willis s.n.*, 30 November 1962 (MEL 77991).

**49. *Daviesia leptophylla*** A.Cunn. ex Don (1832: 125), Crisp (1991a: 260), Jeanes (1996: 758), Crisp (2002: 524), Craigie (2015: 31). Type: ‘Native of New Holland...Cl. 1824.’ Neotype (Crisp 1986: 662): New South Wales, Central Tablelands, 13 km from Kelso along road to Sofala, 33°19’S, 149°31’E, *M.D. Crisp 7502 & J.M. Taylor*, 30 October 1984 (CBG); isoneotype: AD, CANB, K, MEL, NSW

*Daviesia corymbosa* Smith (1805: 507) var. *stjohnii* Anonymous (1906: 133), *nom. nud.*—according to Ewart (1908: 130), this is *D. corymbosa* var. *virgata* (= *D. leptophylla*).

*Daviesia virgata* A.Cunn. ex Hooker (1832: t. 3196). *Daviesia corymbosa* Sm. var. *virgata* (A.Cunn. ex Hook.) Ewart (1908: 130). Type: 'This is another of the numerous interesting discoveries of Mr. ALLAN CUNNINGHAM, by whom it was introduced to the Royal Gardens at Kew, whence it was kindly communicated by Mr. AITON. It inhabits the more elevated, dry, barren parts of the Blue Mountains of New Holland, where it flowers in October.' Type: cult. from N. Holl., Hort. Kew, ex Herb. Hookerianum 1867. Holotype: K.

[*Daviesia corymbosa* Smith (1805: 507) var. *mimosoides* (Brown 1811: 20) Benth (1864: 77), partly.]

[*Daviesia corymbosa* auct. non Sm.: Mueller (1888: 203, partly), Moore & Betche (1893: 133), Black (1924: 296), Black (1948: 435)]

Broom-like, multi-stemmed *shrubs*, to 1.5 (2) m tall, glabrous. *Root anatomy* normal (unistelar). *Branchlets* rigid, erect, angular-terete, ribbed, occasionally leafless towards tips. *Phyllode* scattered, erect or rarely spreading, linear-obovate to linear-elliptic, apically acute or obtuse, mucronate, slightly recurved at margins, tapered to base, articulate, 0–90(–110) × 0–6(–10) mm, convex above, dull yellow-green; venation conspicuous, longitudinal, with a more prominent nerve near each margin; *stipules* present but minute, subulate, 0.1–0.5 mm long. *Unit inflorescences* (1)2(–4) per axil, subcorymbose, 5–10-flowered; *peduncle* 1.3–5(–10) mm long; *rachis* 1.5–6(–10) mm long; *subtending bracts* appressed, subulate, with margins incurved, 0.8–1 mm long. *Pedicels* 1–2.5(–4) mm long. *Calyx* 3.4–4.7 mm long including the 1.25–2.5 mm receptacle; upper 2 lobes united in a truncate, scarcely emarginate lip, 0.75–1.5 mm long; lower 3 lobes shallowly to very shallowly triangular, 0.5–0.75 mm long, ± tinged purple at the acute apices. *Corolla: standard* transversely broadly elliptic, emarginate, 6–6.5 × 6–7 mm including the 1.5–2 mm claw, bright yellow with maroon infusion surrounding an intensely yellow, bilobed, spot at centre; *wings* obovate, rounded and incurved at apex but not enclosing the keel, auriculate, 5.5–6 × 2–2.5 mm including the 1.5–2 mm claw, dark red with orange tips and margins; *keel* half very broadly obovate to depressed-obovate, acute, auriculate, saccate, 4.0–4.5 × 2.0–2.25 mm including the 1.5–1.75 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and discoid, versatile anthers with confluent thecae; outer whorl of 5 with broader, compressed filaments and compressed ovoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute to nearly obtuse, compressed, 5–10 × 3.5–6 mm, faintly reticulate, light brown, slightly lustrous; upper suture strongly sigmoid; lower suture sharply curved. *Seed* compressed, elliptic-reniform in outline, 2.5–3.5 mm long, 1.4–2.2 mm broad, 0.8–1.3 mm thick, chestnut with black mottling or almost all black; *aril* thickly lobed, 1–1.4 mm long. (Fig. 49).

**Chromosome number:**— $n = 9$  (voucher Sands 6110.2.4, cited as *D. virgata* by Sands 1975).

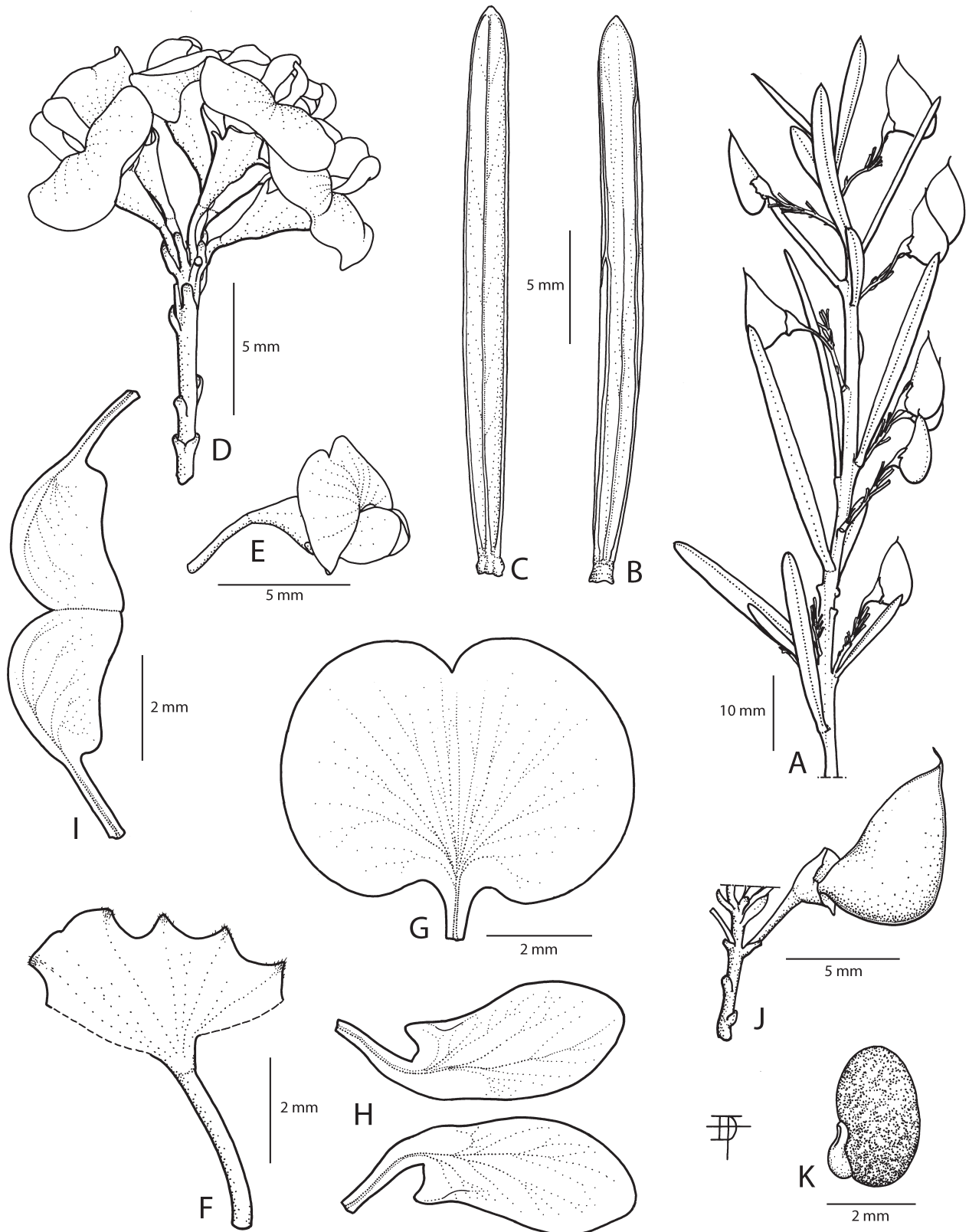
**Common name:**—Narrow-leaf Bitter-pea.

**Flowering period:**—August to December. *Fruiting period:* November to January.

**Distribution:**—Widespread in the tablelands and slopes (occasionally coast) of New South Wales from Nundle southwards, throughout Victoria except the north-west, and in the southern districts of South Australia (mainly Kangaroo Island and the Mt Lofty–Flinders Ranges), with a single old record from Eyre Peninsula at Yeelanna.

**Habitat:**—Grows on dry open sites, usually on skeletal soils, in shrubland or dry (less commonly moist) eucalypt forest. Dominant species in the vegetation are so varied over the wide range of this species that it is impossible to summarise them. Elevation ranges from sea level to 1400 m.

**Selected specimens (701 examined):**—**SOUTH AUSTRALIA. Flinders Ranges:** 2 km SE of St Mary Peak, 31°31'S, 138°34'E, *M.D. Crisp 831*, 31 August 1974 (AD, CBG, MEL, NSW); Wilpena Pound, 31°32'S, 138°33'E, *M.D. Crisp 835*, 31 August 1974 (CBG); 18 km W of Yongala, 33°00'S, 138°35'E, *M.G. Catford s.n.*, 15 November 1975 (AD, CBG 60502). **Lofty South:** 8 km E of Aldgate, 35°02'S, 138°44'E, *M.D. Crisp 1869*, 27 December 1975 (CBG, MO); 2 km N of Goolwa, 35°29'S, 138°46'E, *M.D. Crisp 1870*, 31 December 1976 (CBG, NSW, MEL); *ibid.*, *M.D. Crisp 1871*, 31 December 1976 (CBG); *ibid.*, *M.D. Crisp 1872*, 31 December 1976 (AD, BRI, CBG); *ibid.*, *M.D. Crisp 1873*, 31 December 1976 (CBG). **Kangaroo Island:** 35 km SW of Kingscote, 35°52'S, 137°20'E, *G. Jackson 628*, 5 October 1969 (AD). **NEW SOUTH WALES. South-west Slopes:** 20 km from Ardlethan, 34°21'S, 147°13'E, *G. Butler 849*, 3 October 1978 (CBG); 20 km W of Temora, 34°14'S, 146°14'E, *M.D. Crisp 1655*, 20 November 1975 (AD, CBG). **Central-west Slopes:** Tomingley, 32°38'S, 148°19'E, *R. Coveny 10303*, 17 October 1978 (CANB, NSW). **Central Tablelands:** Bathurst, toward Sofala, 33°12'S, 149°41'E, *M.D. Crisp 7262 & I.R. Telford*, 26 September 1984 (CBG, MEL, NSW, PERTH); 0.5 km S of Peel, 33°19'S, 149°38'E, *M.D. Crisp 7502*, 30 October 1984 (AD, CBG, K, MEL, NSW). **Southern Tablelands:**



**FIGURE 49.** *Daviesia leptophylla*. A. Fruiting branchlet. B. Phyllode, upper (adaxial) surface. C. Same, lower (abaxial) surface. D. Inflorescence. E. Flower. F. Calyx opened out, upper lobes at left. G. Standard. H. Wings. I. Keel, opened out. J. Pod. K. Seed, lateral view. A from *Crisp* 8255; B–I from *Crisp* 7502; J, K from *Thompson* 893. Drawn by D. Fortescue. Adapted from *Crisp* (1991a) with permission from CSIRO Publishing.

Endrick River Bridge, SE, 35°05'S, 150°07'E, *M.D. Crisp 2302 & D.J. Cummings*, 18 November 1976 (CBG, MEL, NSW, PERTH); Cullerin Range, Lachlan River, 35°45'S, 149°24'E, *M.D. Crisp 2311 & I. R. Telford*, 19 November 1976 (AD, BRI, CBG); 4.2 km N of Cullerin, 35°45'S, 149°24'E, *M.D. Crisp 2312*, 19 November 1976 (CBG, NSW); *ibid.*, *M.D. Crisp 2313*, 19 November 1976 (CBG, MEL); *ibid.*, *M.D. Crisp 2314*, 19 November 1976 (BISH, CBG); 2.1 km S of Oak Hill, 35°10'S, 149°09'E, *M.D. Crisp 2356*, 23 November 1976 (CBG); *ibid.*, *M.D. Crisp 2357*, 23 November 1976 (CBG); *ibid.*, *M.D. Crisp 2358*, 23 November 1976 (CBG); *ibid.*, *M.D. Crisp 2359*, 23 November 1976 (CBG, MO); Gungahlin Hill, 35°13'S, 149°07'E, *M.D. Crisp 8255*, 5 December 1988 (AD, CBG, MO); *ibid.*, *M.D. Crisp 8256*, 5 December 1988 (BISH, CBG, MEL, NSW); Little Peppercorn Plain, 35°34'S, 148°37'E, *I.R. Telford 6917*, 9 December 1977 (CBG); Brindabella Valley, 35°23'S, 148°46'E, *H. Thompson 893 & J. Hewat*, 22 January 1987 (CBG); Kydra Reefs Fire Trail, 36°23'S, 149°20'E, *M.D. Tindale 4000 et al.*, 17 January 1975 (NSW). **VICTORIA. Western Highlands:** Lerderderg Gorge, 37°30'S, 144°22'E, *J.H. Willis s.n.*, 13 October 1963 (MEL 501879). **Western Plains:** Bacchus Marsh, 10 km W toward Ingliston, alongside north-western railway, 0.5 km after level crossing, 37°38'S, 144°21'E, *J.H. Ross 2455*, 11 November 1976 (BRI, MEL). **Eastern Highlands:** E of the Christmas Hills, 37°39'S, 145°21'E, *H.I. Aston 460*, 2 December 1959 (MEL); Warrandyte, 37°45'S, 145°13'E, *G.W. Carr 7171*, 26 September 1976 (CANB, MO); 3 km SW of Highlands, 37°10'S, 145°27'E, *T.B. Muir 3518*, 27 October 1964 (MEL); Tamboritha Saddle, 37°29'S, 146°42'E, *P. McDonnell 444*, (CANB). **Gippsland:** Mottle Range Road, 37°39'S, 148°13'E, *A.C. Beauglehole 33956*, 7 September 1970 (CANB, MEL); Buchan to Bruthen road, 37°40'S, 148°03'E, *A.C. Beauglehole 35386*, 12 December 1970 (MEL); 14 km from Nowa toward Buchan, 37°34'S, 148°08'E, *E. F. Constable 5342*, 29 October 1964 (NSW).

**Affinity:**—Despite the long history of confusion between *D. leptophylla*, *D. corymbosa* and *D. mimosoides* (see synonymy above), these species are readily distinguishable. Indeed, none is especially closely related to either of the others (Fig. 1A). The phyllodes of both *D. corymbosa* and *D. mimosoides* lack the diagnostic pair of raised longitudinal veins seen in *D. leptophylla*. In *D. corymbosa*, the venation is prominently reticulate, and in *D. mimosoides*, it is pinnate. Also, both these species lack the slight recurving of the leaf margins seen in *D. leptophylla*, although their phyllode margins can be undulate. While *D. mimosoides* cannot be distinguished from *D. leptophylla* in reproductive morphology, *D. corymbosa* differs from both in having a larger inflorescence with a distinctive gap between the bracts along the peduncle, large spreading bracts and larger flowers.

The two Western Australian species, *D. grahamii* and *D. newbeyi*, are very similar to *D. leptophylla*, though not especially closely related (Fig. 1A). With it they share the unique character (within the *D. latifolia* group) of slightly recurved phyllode margins, as well as longitudinal venation and a broom-like habit. Both *D. grahamii* and *D. newbeyi* differ from *D. leptophylla* in having fewer than 3 flowers per unit inflorescence and acuminate calyxlobes. Additionally, *D. grahamii* has conspicuous recurved stipules.

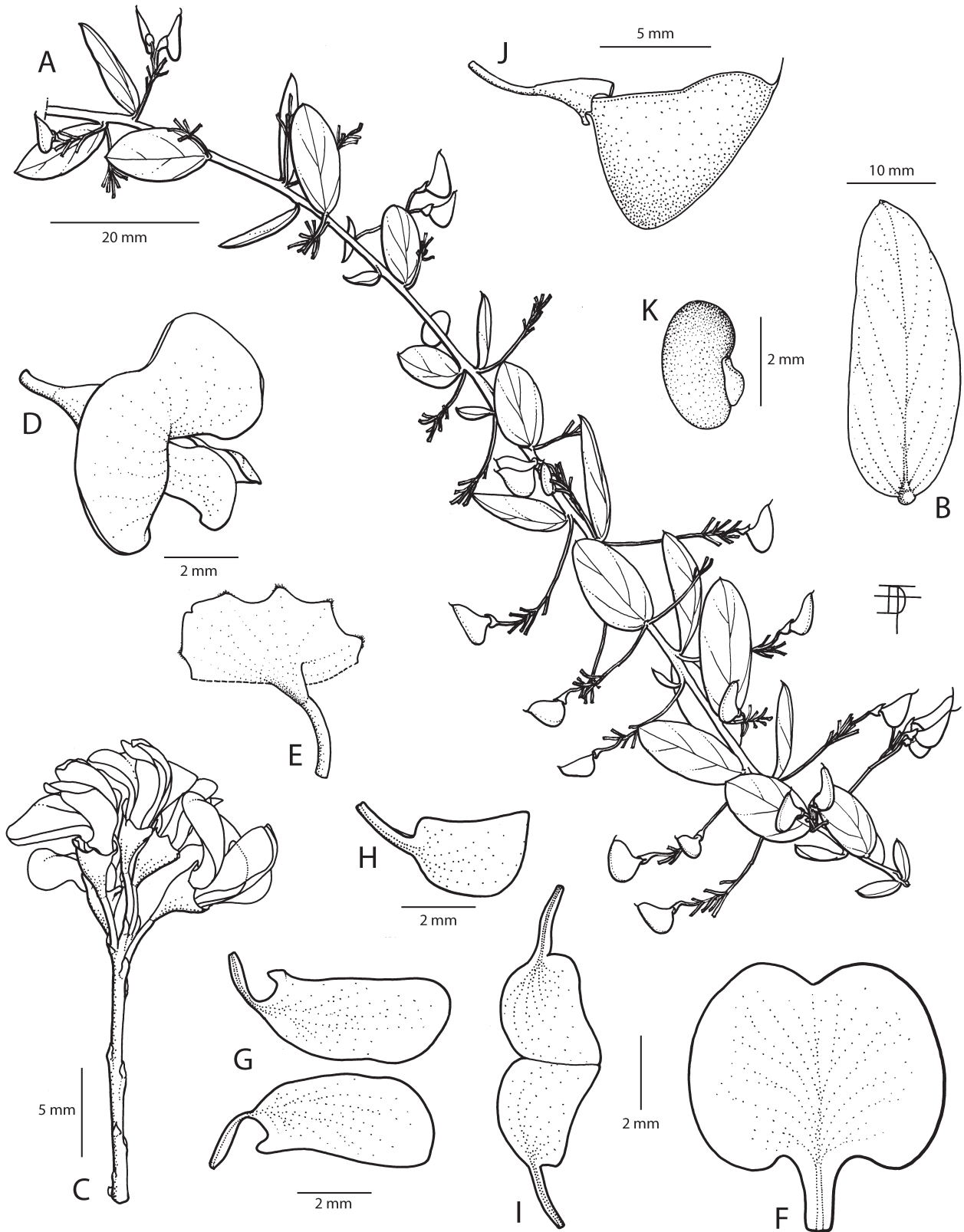
**Variation:**—Over its wide range of distribution and habitat, *D. leptophylla* varies a great deal in some characters. Phyllodes vary in outline from blunt and tapering towards the base to long-acute and tapering towards the apex, and there is a great deal of variation in their length and breadth. The tendency of phyllodes to reduce towards the branchlet apex reaches an extreme in which some plants appear almost leafless (e.g. *Telford 6917*). Floral parts, fruits and seeds vary considerably in size, although little in shape. Most of this variation appears to be local (compare *Beauglehole 35386* with *Constable 5342*, and *Crisp 831* with *Crisp 835*) rather than showing regional differences. Exceptionally, specimens from South Australia, especially the southern districts, tend to have phyllodes that are longer, broader and more frequently obtuse than elsewhere. However, these differences are not sufficiently pronounced or consistent to justify the erection of a separate taxon. A large number of specimens have been cited above to encompass all the variation in *D. leptophylla*.

**Hybrids:**—*Daviesia laevis* × *D. leptophylla*, *D. latifolia* × *D. leptophylla*, *D. laxiflora* × *D. leptophylla*, *D. leptophylla* × *D. mimosoides* (Crisp 1991a).

**50. *Daviesia elliptica*** Crisp (1991a: 279), Crisp (2002: 525). Type: New South Wales, Northern Tablelands, ca. 30 km NNE of Tenterfield, *M.D. Crisp 7290 & I.R. Telford*, 28 September 1984. Holotype: CBG; isotypes: BRI, K, MEL, NSW

*Daviesia latifolia* Brown (1811: 20) var. *parvifolia* Bentham (1864: 76). Type: All three type specimens are mounted on a single sheet in K. Lectotype (Crisp 1991a: 279): Clarence River, *Beckler* (K). Syntype: native of high hills bordering Bathurst plains, *Fraser 160* (K). Syntype: (excluded): Avon Ranges, *F. Mueller* (K)—this specimen appears to be a hybrid, *D. buxifolia* × *D. mimosoides*.





**FIGURE 50.** *Daviesia elliptica*. A. Fruiting branchlet. B. Phyllode. C. Inflorescence. D. Flower. E. Calyx opened out, upper lobes at left. F. Standard. G. Wings. H. Keel. I. Same, opened out. J. Pod. K. Seed, lateral view. A, B from *Crisp 8254*; C–I from *Crisp 7290* (holotype); J, K from *Stuart s.n.* (MEL 80874). Drawn by D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

Open, multi-stemmed *shrubs*, with gracefully arching to weeping branches, 1–1.5(–2) m tall, glabrous. *Root anatomy* normal (unistelar). *Branchlets* angular, ribbed. *Phyllodes* rather crowded, ascending to reclinate (sometimes recurved), elliptic, occasionally narrow, flat or undulate, rounded to acute at apex, shallowly crenate, cuneate or rounded at the articulate base, 6–50 × 3–25 mm, glossy green; venation pinnate, usually conspicuous but scarcely prominent. *Unit inflorescences* 1(2) per axil, corymbiform, 4–10-flowered; *peduncle* 3.5–15 mm long; *rachis* 1.5–10 mm long; *subtending bracts* appressed, subulate, with incurved margins, 0.8–1.4 mm long. *Pedicels* 1–4 mm long. *Calyx* 3–3.5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united into a truncate or obtuse, scarcely notched lip, ca. 1.5 mm long; lower 3 lobes shallowly triangular, ca. 0.5 mm long, thickened and darkened at apices. *Corolla: standard* strongly reflexed, very broadly ovate, emarginate, ca. 7 × 7.5 mm including the ca. 1.5 mm claw, yellow infused with dark red or maroon around a strongly bilobed richly yellow centre; *wings* narrowly obovate, rounded and incurved at apex but not overlapping, auriculate, ca. 7 × 2.5 mm including the ca. 2 mm claw, maroon towards base, yellow at margins and apex; *keel* half depressed-obovate, falcate, acute, auriculate, saccate, ca. 5 × 2.5 mm including the ca. 2 mm claw, very dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, subterete filaments and compressed globose, versatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and compressed obloid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly to very broadly obtriangular, acute or obtuse, compressed, 7–9 × 5–6 mm, smooth, glossy, light brown; upper suture strongly sigmoid; lower suture acute. *Immature seed* compressed ellipsoid, to 2.9 mm long, 1.9 mm broad, 0.6 mm thick, becoming red-brown; *aril* thick, dilated below hilum, ca. 1 mm long. (Fig. 50).

**Common name:**—Wild Hops.

**Flowering period:**—September to November. *Fruiting period:* November and December.

**Distribution:**—Extends from Dalveen in the Granite Belt of far southern Queensland into the eastern half of New England in northern New South Wales, south to near Guyra.

**Habitat:**—*Daviesia elliptica* is restricted to a narrow belt along and near the eastern escarpment of the tablelands at moderately high elevations (800–1020 m), where it grows in sandy soils derived from granite. Associated vegetation is eucalypt forest with a sclerophyll shrub understorey.

**Selected specimens (27 examined):**—**QUEENSLAND. Darling Downs:** Dalveen, 28°29'S, 151°58'E, *M.D. Crisp 7314 & I.R. Telford*, 28 September 1984 (BRI, CBG, MEL, NSW); Whisky Creek, 28°41'S, 151°55'E, *M.D. Crisp 7322 & I. R. Telford*, 28 September 1984 (CBG); 1.6 km W of Cottonvale, 28°32'S, 151°57'E, *K.A.W. Williams 75094*, 7 October 1975 (BRI). **NEW SOUTH WALES. Northern Tablelands:** Anne River, Clarence River, 30°07'S, 151°53'E, *Dr. Beckler* (MEL 79005); 20 km NE of Tenterfield, 28°55'S, 152°06'E, *R.G. Coveny 5723 & N.S. Lander*, 3 October 1974 (BRI, NSW); Boonoo Boonoo, 28°53'S, 152°06'E, *J.L. Boorman*, November 1904 (NSW 35243); Wilson's Downfall, 28°43'S, 152°06'E, *M.D. Crisp 7308*, 28 September 1984 (CBG, NSW); ca. 21 m E of Tenterfield, 2.3 km from Timbarra toward Poverty Point, 29°01'S, 152°14'E, *M.D. Crisp 7341 & I.R. Telford*, 29 September 1984 (BRI, CBG, K, MEL, NSW); 38.5 km on Gwydir Hwy from Glen Innes towards Grafton, 1 km E of Timbarra River, 29°39'S, 152°03'E, *M.D. Crisp 7362 & I.R. Telford*, 29 September 1984 (AD, CBG); Sugarloaf, 29°14'S, 151°45'E, *M. Lavelle s.n.*, 9 October 1886 (BRI 216455); base of Bluff, 29°10'S, 152°00'E, *C. Stuart s.n.* (MEL 80874–5). **CULTIVATED.** Australian National Botanic Gardens, section 4, no. 8410621, *M.D. Crisp 8254*, 16 November 1988 (CBG).

**Affinity:**—*Daviesia elliptica* is most similar to *D. buxifolia* and is also closely related to *D. mimosoides* and *D. latifolia* (Fig. 1A). *Daviesia buxifolia* differs in having phyllodes that are ovate to orbicular, rather than elliptic, and at the base they are usually cordate, sometimes rounded, but never cuneate; also, the phyllodes are conspicuously crenulate, whereas those of *D. elliptica* are obscurely crenate. *Daviesia mimosoides* differs in its narrowly elliptic to linear phyllodes that are tapered to the base, dull to glaucescent and rarely obscurely crenate (subsp. *acris* only). The peduncles of *D. mimosoides* are usually shorter than in *D. elliptica*, being less than 5 mm long. *Daviesia latifolia* has large (20–150 mm long), coarse, conspicuously reticulate, dull to glaucescent phyllodes that are acuminate or tapered to the apex, and racemes with numerous, evenly spaced flowers.

**Economic uses:**—Notes attached to a specimen (BRI 216455) suggest a variety of uses for this plant, comparable with those of *D. mimosoides*. Mr M. Lavelle, Licensed Surveyor at Camp Sugarloaf via Stanthorpe, Queensland, sent the following letter in 1886 to F. M. Bailey, the Queensland Colonial Botanist.

'Dear sir,

'I herewith forward a specimen of a shrub which grows here, and which is called here 'Wild Hops'.

'Horses are very fond of it, and sheep and cattle eat it. It keeps green all the year round, even in the driest season.

The average height of the shrub varies from one to two feet; but some reach four feet. Old shepherds state that it makes good yeast, and that they have used it for years, but it makes the bread a little darker. For making beer they state that it is superior to hops.

‘Would you be good enough to let me know the proper name of this plant and if you think it of any value as fodder plant. The soil where this shrub grows varies from good loam to sandy loam, and the district is at an elevation of over 2000 feet above sea level.

‘Yours Faithfully,  
M. Lavelle,  
Licd. Surveyor.’

**Hybrids:**—*Daviesia elliptica* × *D. latifolia*, *D. elliptica* × *D. latifolia* × *D. mimosoides*, *D. elliptica* × *mimosoides*. Despite the diagnostic differences between the species, *D. elliptica* is known to hybridize with both *D. latifolia* and *D. mimosoides*. *Daviesia buxifolia* does not get the opportunity to hybridize with *D. elliptica*, despite the obvious similarities between these two species, because they are separated by a gap of several hundred kilometres.

**51. *Daviesia latifolia*** Brown (1811: 20), Bentham (1864: 76), Stanley & Ross (1983: 253), Crisp (1991a: 286), Jeanes (1996: 756), Crisp (2002: 525). Type: ‘Nat. of Van Diemen’s Island. Robert Brown, Esq. Introd. 1805.’ Lectotype (Crisp 1991a: 286): In campis prope Western Arm, Port Dalrymple, *R. Brown*, 6.i.1804 (BM—sheet annotated ‘Kew Negative No. 16308’); isolectotype: K (on a sheet with the ‘Derwent’ syntype). Syntype: Derwent, Van Diemen’s Land, *R. Brown* (BM, CANB, K—on a sheet with the ‘Port Dalrymple’ syntype, NSW). Syntype: Van Diemens Land, without precise locality, *R. Brown* (BRI 216625–6, DBN, E, K—‘Negative No. Kew 920’, MEL). A specimen at DBN, cult. from Kew, ex Herb. Dr. W.R. McNab, annotated by MDC as ‘?syntype’, is not part of the type material

*Daviesia latifolia* R.Br. var. *lanceolata* Regel (1857: 157). Holotype: ex horto bot. Petropolitano, v.s. *Regel*, 56.4 (LE).

Slender, usually multi-stemmed, open *shrubs*, 1–3 m high, rarely to 5 m, glabrous, glaucous. *Root anatomy* normal (unistellar). *Branchlets* ± arching, lax, angular. *Phyllodes* scattered, ascending to spreading, broadly to narrowly elliptic or ovate, rarely linear, apically rounded to long-acute, acuminate, crenate, usually strongly undulate, contracted (usually abruptly) to a narrow petiole-like articulate base 3–20 mm long, 20–150 × 5–70 mm, coriaceous with prominently reticulate venation. *Juvenile phyllodes* resembling those of adults, proportionally a little broader. *Unit inflorescences* 1 or 2 (3) per axil, racemose, with numerous evenly spaced flowers; *peduncle* 5–25 mm long; *rachis* 20–70(–130) mm long; *barren basal bracts* imbricate; *subtending bracts* widely spreading to reclinate, ovate or elliptic, tending to spatulate, sometimes broad, with strongly incurved margins, stipitate, 2–4 mm long. *Pedicels* 1.5–4 mm long. *Calyx* 3.5–5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united into a truncate to obtuse, entire or scarcely emarginate lip, 0.75–1.25 mm long; lower 3 lobes shallowly triangular, often tinged with purple at the apices, 0.5–1 mm long. *Corolla: standard* very broadly ovate to depressed-ovate, emarginate, ± cordate at the base, 6–9 × 7–9.5 mm including the 1.25–2.5 mm claw, orange-yellow with dark brownish red or maroon infusion towards the centre and a central intensely yellow bilobed marking; *wings* obovate, rounded and incurved at the apex, auriculate, 5.5–8 × 2.5–3 mm including the 1.5–2.5 mm claw, maroon grading to yellow distally; *keel* half very broadly ovate to depressed-ovate, acute, auriculate, saccate, 4.5–5.5 × 2–2.5 mm including the 1.5–2 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete to slightly compressed filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, strongly compressed filaments and compressed ovoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular to very broadly obtriangular, acute to scarcely obtuse, strongly compressed, 6.5–11 × 4–7 mm, red-brown; upper suture sigmoid; lower suture acute. *Seed* compressed ellipsoid, 2.5–3.7 mm long, 1.6–2.2 mm broad, 0.8–1.4 mm thick, red-brown with heavy black mottling, sometimes all black; *aril* obloid, thickly lobed, 1.1–2.1 mm long. (Fig. 51A–K).

**Chromosome number:**— $n = 9$ ,  $2n = 18$  (Sands 1975).

**Common name:**—Hop Bitter-pea.

**Flowering period:**—September to December. *Fruiting period:* November to February.

**Distribution:**—From far southern Queensland’s granite belt, southward through the tablelands and western slopes of New South Wales to Tasmania and west through Victoria as far as Portland.



**FIGURE 51.** *Daviesia latifolia*. A. Flowering branchlet. B, C. Phyllode variation. D. Inflorescence. E. Flowers with subtending bracts. F. Calyx opened out, upper lip at left, with pedicel and subtending bract. G. Standard. H. Wings. I. Keel. J. Same, opened out. K. Pod. *Daviesia latifolia* × *leptophylla*. L. Phyllode with inflorescence. A from Crisp 6785; B from Fullarton s.n. (MEL 564753); C from Gauba s.n. (CBG 2701); D from Crisp 6786; E–J from Crisp 7599; K from Gauba s.n. (CBG 2588); L from Fullarton s.n. (MEL 564756). Drawn by A. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Habitat:**—Grows in dry sclerophyll communities, mostly dominated by eucalypts, frequently as the dominant understorey shrub, on a wide range of soils. The species has a large elevational range, from 0–1800 m.

**Selected specimens (491 examined):**—**QUEENSLAND. Darling Downs:** Eukey, Stanthorpe, 28°46'S, 151°58'E, *M.S. Clemens s.n.*, November 1944 (BRI 214790); 5 km NNE of Wallangarra, 28°53'S, 151°58'E, *M.D. Crisp 7331*, 28 September 1984 (CBG, MO, NSW). **NEW SOUTH WALES. Northern Tablelands:** Tingha, 29°58'S, 151°13'E, *R.H. Cambage 920*, 16 October 1903 (NSW); Tenterfield, 29°03'S, 152°01'E, *C.F. Laseron s.n.*, November 1909 (CBG 9001468, NSW). **Central-west Slopes:** Coonabarabran, roadside, 31°16'S, 149°17'E, *J. Lamont 249*, September 1883 (BM); Mudgee, toward Cassilis, 32°08'S, 149°19'E, *M.E. Phillips 314*, 19 September 1972 (A, CBG). **Central Tablelands:** 4 km SW of the Kandos Weir, 32°51'S, 150°14'E, *M.D. Crisp 1295*, 5 October 1975 (BRI, CBG, PERTH); Mt Canobolas path, 33°08'S, 150°13'E, *J. Carrick 3204*, 22 October 1972 (AD, CANB, NSW); 3 km NW of Fitzroy Falls, 34°38'S, 150°28'E, *M.D. Crisp 6785*, 14 October 1980 (CBG, US); *ibid.*, *M.D. Crisp 6786*, 14 October 1980 (BM, CBG); 6.4 km S of Blayney, 33°35'S, 149°15'E, *M. Tindale s.n.*, 31 October 1963 (NSW 137137). **Southern Tablelands:** Yarrangobilly, 35°37'S, 148°28'E, *E. Gauba s.n.*, 15 January 1950 (CANB 2588); towards Burrinjuck, *E. Gauba s.n.*, 7 May 1950 (CANB 2701); near Geehi, 36°23'S, 148°11'E, *\*C.H. Gittins 638*, January 1963 (NSW). **South-west Slopes:** Carabost State Forest, 35°40'S, 147°40'E, *T.B. Muir 4594*, 24 October 1967 (MEL). **VICTORIA. Eastern Highlands:** E slopes of Mt Stirling, 37°08'S, 146°31'E, *\*M.G. Corrick 8000*, 31 January 1982 (CANB, MEL); 3 km from Mirimbah, 37°07'S, 146°25'E, *\*M.D. Crisp 7599–7602*, 7 November 1984 (CBG); *ibid.*, *\*M.D. Crisp 7603*, 7 November 1984 (CBG, MEL, NSW); 5.5 km ESE of Mt Howitt, 37°12'S, 146°42'E, *\*M.D. Crisp 8329*, 30 November 1989 (BRI, CBG, MEL, NSW); *ibid.*, *\*M.D. Crisp 8330*, 30 November 1989 (AD, CBG, HO, MEL); Mt Samaria State Park, 36°52'S, 146°04'E, *A.D.J. Piesse 521*, 12 November 1986 (MEL); 4.5 km ESE of Mt Howitt, 37°11'S, 146°12'E, *\*M.D. Crisp 8331–2*, 30 November 1989 (CBG, MEL); 6 km SSE of Longwood, 36°51'S, 145°27'E, *M.D. Crisp 8339*, 3 December 1989 (CBG); Templestowe, 37°46'S, 145°08'E, *E. Fullarton s.n.*, October 1979 (MEL 564753). **Western Plains:** Gorae West, near Portland, 38°15'S, 141°30'E, *R. Melville 1679*, 16 October 1952 (AD, MEL, PERTH). **Gippsland:** 36 km ENE of Orbost, 37°39'S, 148°51'E, *M.D. Crisp 7636*, 9 November 1984 (AD, CBG, MEL, NSW); *ibid.*, *M.D. Crisp 7637*, 9 November 1984 (CBG, MEL, NSW); Lake Reeve Lakelet, 38°09'S, 147°28'E, *A.C. Beauglehole 62805*, 19 December 1978 (CANB, MEL). **TASMANIA.** Harford, 41°14'S, 146°33'E, *H.J. Hamilton 131*, 23 October 1932 (HO); Tyenna River, near Westaway, 42°43'S, 146°41'E, *M.E. Phillips 994*, 3 December 1965 (CBG 31450).

\* montane form. See below for explanation.

**Affinity:**—Within eastern Australia, *D. latifolia* is closely related to *D. corymbosa*, *D. laevis* and *D. laxiflora*. The corymbose unit inflorescence of *D. corymbosa* distinguishes it from the other three species, which have racemes with evenly spaced flowers. *Daviesia laevis* has bracts similar to those in *D. latifolia*, but differs in having phyllodes with entire margins and obscure tertiary venation, and shorter unit inflorescences (rachis usually 10–30 mm long). In *D. laxiflora*, the inflorescence is longer, like that of *D. latifolia*, but the bracts are subulate, appressed to the pedicels and less than 2 mm long. Its flowers are strongly fragrant, by contrast with those of *D. corymbosa*, *D. laevis* and *D. latifolia*. In Western Australia, species of the *D. cordata* species group are similar to *D. latifolia* but may be distinguished by the accrescent involucre bracts in the unit inflorescence.

**Montane form:**—In montane forests of eastern Victoria and the Snowy Mountains, New South Wales, especially the zones at elevations of 800–1800 m, dominated by *Eucalyptus delegatensis* Baker (1900: 305) and *E. dalrympleana* Maiden (1920: 137), there occurs a form of *D. latifolia* with narrowly elliptic phyllodes up to 140 mm long. These plants are often larger than usual for the species, sometimes arborescent and up to 5 m tall. The flowers also are large, for example the standard is 8–9 mm broad (*Crisp 7599* and *8331*), compared with widths as low as 6–7 mm in plants sampled at lower elevations (*Crisp 1295*, *6786* and *8332*). These plants appear to form a cline with the more typical form at lower elevations (e.g. compare *Crisp 8329–8331* with *8332*). The montane form has been confused with *D. laxiflora*, which occurs in the same habitat but never sympatrically; in fact, *D. laxiflora* replaces the montane form of *D. latifolia* more or less west of the Snowy Range in Victoria (it has a disjunct occurrence to the east, around Mt Delusion). While similar in habit and leaf shape, *D. laxiflora* may be readily distinguished from the montane form of *D. latifolia* by its bracts (above) and perfume. Note that narrowly elliptic leaves occur sporadically throughout the range of *D. latifolia*, e.g. *Beauglehole 62805*, *Cambage 920*, *Crisp 7331*, *Gauba s.n.* (CBG 2701) (Fig. 51C) and *Phillips 314*. Large flowers also occur in non-montane populations.

**Hybrids:**—*Daviesia buxifolia* × *D. latifolia*, *D. corymbosa* × *D. latifolia*, *D. elliptica* × *D. latifolia*, *D. elliptica* × *D. latifolia* × *D. mimosoides*, *D. latifolia* × *D. leptophylla* (Fig. 51L), *D. latifolia* × *D. mimosoides*.

**52. *Daviesia laxiflora*** (J.H. Willis) Crisp (1991a: 282), Jeanes (1996: 758), Crisp (1995: 1207). *Daviesia corymbosa* Smith (1805: 507) var. *laxiflora* Willis (1957: 191), excluding Grampians region populations. *Daviesia mimosoides* R.Br. var. *laxiflora* (J.H. Willis) J.H. Willis (1967: 123). Type: 'Slopes of Mt. Matlock toward Woods Point, at about 4000 ft., J.H. Willis, 2 November 1940'. Holotype: MEL 77965; isotype: MEL 77966

[*Daviesia corymbosa* Sm. var. *arborea* auct. non (W.Hill) Maiden: H.B. Will. in Ewart (1931: 621)]

Large *shrubs* or small *trees* up to 10 m tall, glabrous, ± glaucous. *Root anatomy* unknown. *Branchlets* ascending or somewhat arching, angular. *Phyllodes* scattered, spreading at ca. 45°, narrowly elliptic to almost linear, long-acute to acute at apex, flat or gently undulate, slightly crenate, tapered towards the articulate base and finally contracted to a pseudo-petiole 3–15 mm long, 40–160 × 6–30 mm; secondary venation pinnate, usually prominent; tertiary venation coarsely reticulate, less conspicuous. *Juvenile phyllodes* elliptic to narrowly so; *intermediate phyllodes* proportionally broader (to 60 mm), acuminate to obtuse or rounded at apex, with the pseudo-petiole clearly differentiated. *Unit inflorescences* 1–3(–5) per axil, racemose, lax, with many evenly spaced flowers; *peduncle* 7–15 mm long; *rachis* (13–)25–100 mm long; *barren basal bracts* widely spaced, not imbricate; *subtending bracts* appressed to pedicels, subulate to deltoid, 1–2 mm long. *Flowers* very fragrant. *Pedicels* (1–)2–7 mm long. *Calyx* 4.5–5.5 mm long including the ca. 1.5 mm receptacle to which it is contracted; upper 2 lobes united into a truncate to rounded, scarcely emarginate lip, ca. 1.5 mm long; lower 3 lobes similar, shallowly to very shallowly triangular, often tinged purple at the slightly acuminate apices, ca. 0.5 mm long. *Corolla: standard* transversely elliptic to transversely broadly elliptic, sometimes slightly oblong, emarginate, truncate to slightly cordate at base, 8.5–10.5 × 9.5–11.5 mm including the 2–2.5 mm claw, pure yellow with a narrow brownish red marking surrounding an intensely yellow oblong to bilobed spot at the centre; *wings* obovate to almost spatulate, rounded and incurved at the apex, ± enclosing the keel, auriculate, 8–9 × 3–4.5 mm including the 2–2.5 mm claw, yellow with a brownish red infusion towards the base; *keel* half very broadly obovate to depressed-obovate, acute, auriculate, saccate, 5–5.5 × 2–2.5 mm including the 1.8–2.1 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, compressed-terete filaments and discoid, versatile, anthers with confluent thecae; outer whorl of 5 with shorter, broader, very compressed filaments and compressed-ovoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate to scarcely obtuse, strongly compressed, 7–10 × 5–7 mm, usually straw-coloured, lustrous, smooth, rarely dull brown; upper suture sigmoid; lower suture acute. *Seed* compressed ellipsoid, 2.4–3.3 mm long, 1.6–1.9 mm broad, 1.3–1.4 mm thick, light brown to chestnut with black mottling, sometimes nearly all black; *aril* oblong in outline with a fleshy distal lobe, 1.4–2.4 mm long. (Fig. 52).

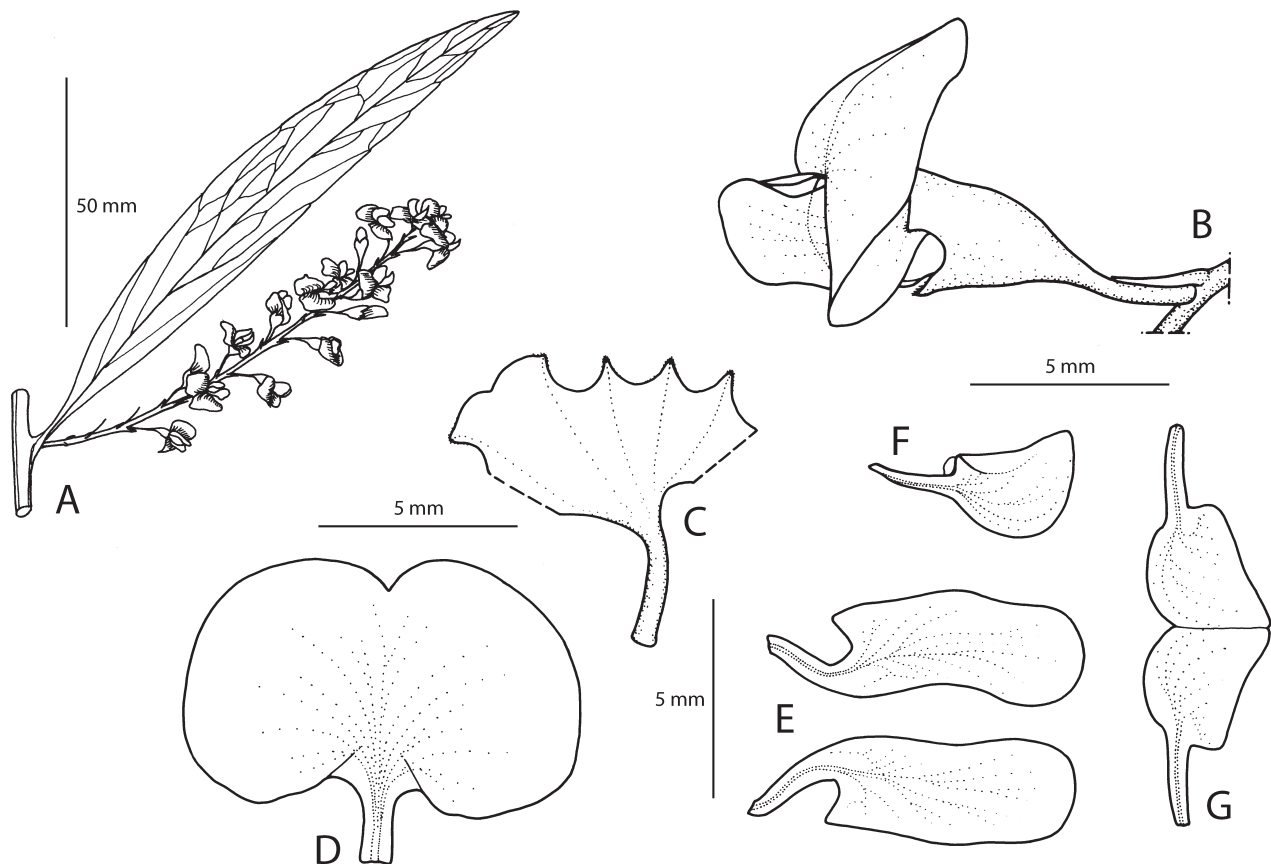
**Flowering period:**—October to January. **Fruiting period:** January to March.

**Distribution:**—Restricted to Victoria, where it occurs in the highlands east of Melbourne, from near Marysville east to Mt Delusion and south to near Wilsons Promontory. Records from western Victoria are probably misidentifications of *D. laevis*.

**Habitat:**—This species occupies a specialised habitat in moist montane forests at elevations of 900 to 1300 m, or occasionally lower, e.g. *Crisp 7630–1* at 460 m and *Beaulehole 75418A* from below 500 m. It typically occurs as a dominant understorey shrub, together with *Acacia obliquinervia* Tindale (1968: 76), in tall open forest of Alpine Ash (*Eucalyptus delegatensis*). There it can also be associated with *E. dalrympleana*, *E. obliqua* or *E. sieberi*. At the lower-elevation site at Seaton (*Crisp 7630–1*), it grows in forest dominated by *E. cypellocarpa* Johnson (1962: 114), *E. obliqua* and *E. sieberi* and stringybarks. Like *D. suaveolens*, *D. laxiflora* flowers prolifically, and the abundant large shrubs make an impressive display in the forest, which is permeated by the fragrance of the flowers.

**Selected specimens (61 examined):**—**VICTORIA. Eastern Highlands:** 1 km W of Mt Delusion, at junction of roads, 37°19'S, 147°31'E, *A.C. Beaulehole 37071*, 26 February 1971 (CANB, MEL); Mt Margaret Gap, 37°29'S, 145°48'E, *E.J. Carroll s.n.*, 21 December 1965 (AD 97026144, CBG 18057); Lake Mountain, ca. 1 km from Kellys Paddock towards summit, 37°30'S, 145°53'E, *G.W. Carr 6374–9*, 6 December 1975 (CBG); 62.5 km N of Licola, 37°38'S, 146°37'E, *J. Carrick 3140*, 20 January 1972 (AD, CANB); Jamieson to Licola, 37°21'S, 146°18'E, *M.D. Crisp 7621*, 8 November 1984 (CBG, MEL, MO, NSW); Walhalla, 37°57'S, 146°27'E, *M. Tindale s.n.*, 21 January 1967 (NSW 137129); Seaton, towards Walhalla, 37°55'S, 146°37'E, *M.D. Crisp 7630–1*, 8 November 1984 (AD, CBG, K, MEL, NSW); Bennison Plains, 37°28'S, 146°44'E, *M.D. Crisp 8333*, 1 December 1989 (CBG, MEL, NSW); Bennison Spur, 37°30'S, 146°42'E, *M.D. Crisp 8335*, 1 December 1989 (AD, CBG, HO, MEL, MO, PERTH); Mt Dow, Nicholson area, 37°26'S, 147°39'E, *J.R. Turner 12*, 25 November 1984 (CANB,

MEL); 6.4 km SE of Wrens Flat, 37°26'S, 146°23'E, *J.H. Willis s.n.*, 24 February 1949 (MEL 77959–60). **Gippsland:** Wilsons Promontory, 38°58'S, 146°18'E, *E. Lyndon per A.C. Beauglehole 75418A*, 11 November 1983 (CANB, MEL).



**FIGURE 52.** *Daviesia laxiflora*. A. Phyllode with axillary inflorescence. B. Flower. C. Calyx opened out, upper lip at left. D. Standard. E. Wings. F. Keel. G. Same, opened out. A from *Carr 6374*; B–G *Crisp 7621*. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Affinity:**—*Daviesia laxiflora* is similar to *D. laevis*, *D. latifolia* and *D. corymbosa*. Although *D. laxiflora* was originally described as a variety of *D. corymbosa*, the latter may be readily distinguished by its corymbose inflorescences. Both *D. laevis* and *D. latifolia* differ in having larger (2–4 mm long), stipitate, patent bracts, scarcely fragrant flowers, and in addition, *D. laevis* has entire phyllode margins and shorter racemes (rachis 20–30 mm long, rarely to 80 mm). There is a montane form of *D. latifolia* which occupies the same habitat at different localities (mostly to the east of the range of *D. laxiflora*) and superficially resembles *D. laxiflora*, but it may be distinguished by the bracts and lack of floral fragrance as indicated above. This comparison is discussed in more detail above, under the montane form of *D. latifolia*. Although *D. laxiflora* has been placed as a variety of *D. mimosoides*, these taxa are not especially closely related. *Daviesia mimosoides* differs in having much shorter racemes (rachis to 15 mm long) and smaller flowers (standard to 8 mm broad), which are scarcely fragrant.

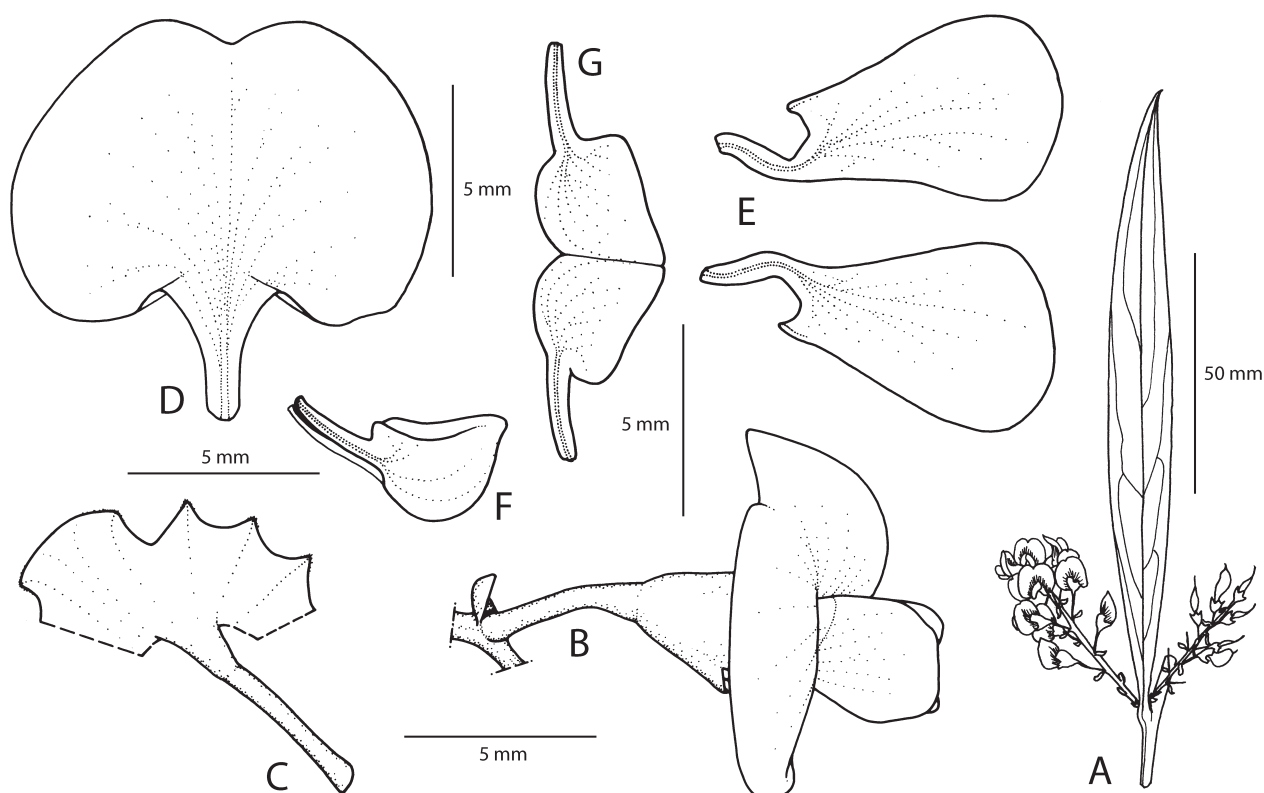
**Hybrids:**—*Daviesia laxiflora* × *D. leptophylla*.

**53. *Daviesia laevis*** Crisp (1991a: 285), Crisp (1995: 1206), Jeanes (1996: 758). Type [approximate locality data given because the species is rare]: Victoria, Western Highlands, Grampians, *M.D. Crisp 8324 & J. M. Taylor*, 28 November 1989. Holotype: CBG; isotypes: AD, BISH, CANB, K, MEL, MO, NSW

[*Daviesia corymbosa* Smith (1805: 507) var. *laxiflora* Willis (1957: 191), partly, Grampians region only. *Daviesia mimosoides* Brown (1811: 20) var. *laxiflora* (J.H. Willis) J.H. Willis (1967: 123), partly, Grampians region only.]

Slender, open *shrubs*, 2–4 m tall at maturity, sometimes arborescent, usually with arching branches, glabrous, ± glaucous. *Root anatomy* unknown. *Branchlets* ascending to arching, angular-terete. *Phyllodes* scattered, erect to

somewhat spreading, rarely reclinate, narrowly elliptic to linear, apically acute to long-acute, flat, entire, tapered towards base and finally contracted to a slight pseudo-petiole 2–10 mm above the articulation, 40–150 × 5–20(–25) mm, secondary venation pinnate, tertiary venation obscure, texture coriaceous. *Unit inflorescences* racemose, 1–3 per axil, significantly shorter than the phyllodes, with 5–10(–15) evenly spaced flowers; *peduncle* 2–10(–30) mm long; *rachis* 20–30, rarely to 80 mm long; *barren basal bracts* well spaced; *subtending bracts* widely spreading to reclinate, obovate or narrowly so, tending to spatulate, with strongly incurved margins, stipitate, 2–3 mm long. *Flowers* scarcely fragrant. *Pedicels* 1.5–4 mm long. *Calyx* campanulate, 4.5–5 mm long including the 1.5–1.75 mm receptacle to which it is contracted; upper 2 lobes united into a truncate-rounded, entire or apiculate lip, 1.75–2 mm long; lower 3 lobes uniform, very shallowly triangular, usually tinged with purple at the acuminate tips, 0.5 mm long. *Corolla*: *standard* depressed-ovate, emarginate, slightly cordate, 8.5–11 × 9.5–11.5 mm including the ca. 2.5 mm claw, orange-yellow with a dark brownish red infusion surrounding an intensely yellow oblong to bilobed spot at the centre; *wings* obovate to spatulate, rounded and incurved at the apex, auriculate, 8.5–9.5 × 4–5 mm including the 2.5–3 mm claw, orange-yellow at the tips, infused with brownish red towards the base; *keel* half transversely elliptic, acute to shortly acuminate, saccate, auriculate, 5.5–6 × 2.5–3 mm including the 2–3 mm claw, dull red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, compressed-terete filaments and compressed, very broadly ovoid, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, very compressed filaments and compressed, broadly ellipsoid to discoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, ± acute, strongly compressed, 7–10 × 5–6 mm, straw-coloured to light brown, lustrous, faintly reticulate; upper suture sigmoid; lower suture acute. *Seed* compressed ovoid, 2.5–3.2 mm long, 1.6–2.1 mm broad, 0.9–1.1 mm thick, red-brown with black mottling; *aril* oblong in outline with a fleshy distal lobe, 1.4–1.9 mm long. (Fig. 53).



**FIGURE 53.** *Daviesia laevis*. A. Phyllode with axillary inflorescences. B. Flower. C. Calyx opened out, upper lip at left. D. Standard. E. Wings. F. Keel. G. Same, opened out. A from Symon 1787; B–G from Woolcock W1906. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Flowering period:**—October and November. **Fruiting period:** January.

**Distribution:**—Western Victoria, restricted to the Grampians and adjacent ranges, the latter mainly the Mt Cole plateau, east of Ararat. Records from east of Melbourne are probably misidentifications of *D. laxiflora* or *D. mimosoides*.



**Habitat:**—Very localised in sheltered montane sites, usually in gullies, sometimes among boulders, on sandy or skeletal soils derived from sandstone or granite. *Daviesia laevis* grows in open forest dominated by eucalypts such as *E. obliqua*, *E. globulus* Labillardière (1800: t. 13) and stringybarks, where it seems to occur most frequently at the margins of tall shrub thickets fringing creeks with *Leptospermum*, *Melaleuca* and sedges including *Gahnia* J.R. & J.G.Forster (1775: 51).

**Conservation status:**—National: Vulnerable. Vic.: Vulnerable (see detailed assessment by Murphy *et al.* 2006).

**Selected specimens (29 examined):**—Approximate locality data given because the species is rare. **VICTORIA. Western Highlands:** Grampians, *E. & A.K. Ashby* 227, November 1940 (AD); *L. Banfield s.n.*, 10 November 1977 (MEL 77967); *ibid.*, 37°00'S, 142°30'E, *A.C. Beaglehole* 30762, 4 June 1969 (MEL); *ibid.*, *Fisheries and Wildlife Division s.n.*, 1 November 1974 (MEL 1563096); *ibid.*, *D.J. Paton* 5, November 1919 (MEL); *ibid.*, 37°10'S, 142°30'E, *D.E. Symon* 1787, 3 January 1961 (AD, K, NE); *ibid.*, 37°10'S, 142°30'E, *C.E. & D.T. Woolcock* W1906, 15 November 1984 (CBG, K, MEL); Mt Cole plateau, 37°20'S, 143°20'E, *D. Sullivan* 3, 13 January 1877 (MEL).

**Affinity:**—*Daviesia laevis* is closely related to *D. corymbosa*, *D. latifolia* and *D. laxiflora*. *Daviesia corymbosa* is distinguished immediately by its corymbose inflorescence and prominently reticulate leaf venation.

Originally, *D. laevis* was included in *D. mimosoides* var. *laxiflora*, which was later raised to species rank (Crisp 1991a), while *D. laevis* was simultaneously segregated as a new species. Undoubtedly, these species are closely related, having a similar facies and habitat, and sharing the greatest flower size in the *D. latifolia* group. However, *D. laxiflora* is restricted to the ranges east and south of Melbourne and differs in having phyllodes with visibly reticulate tertiary venation, more or less crenate leaf margins, strongly perfumed flowers, longer racemes (rachis usually 35–110 mm long) and most diagnostically, appressed, subulate subtending bracts which are less than 2.5 mm long. The inflorescences of *D. laevis* are usually shorter than 40 mm (rarely as long as 80 mm; *Paton* 5), and the subtending bracts are divaricate to reclinate and obovate to spatulate.

*Daviesia latifolia* has subtending bracts similar to those of *D. laevis* but is readily distinguished by its prominently reticulate phyllodes with crenate margins and usually longer racemes (rachis 25–150 mm long).

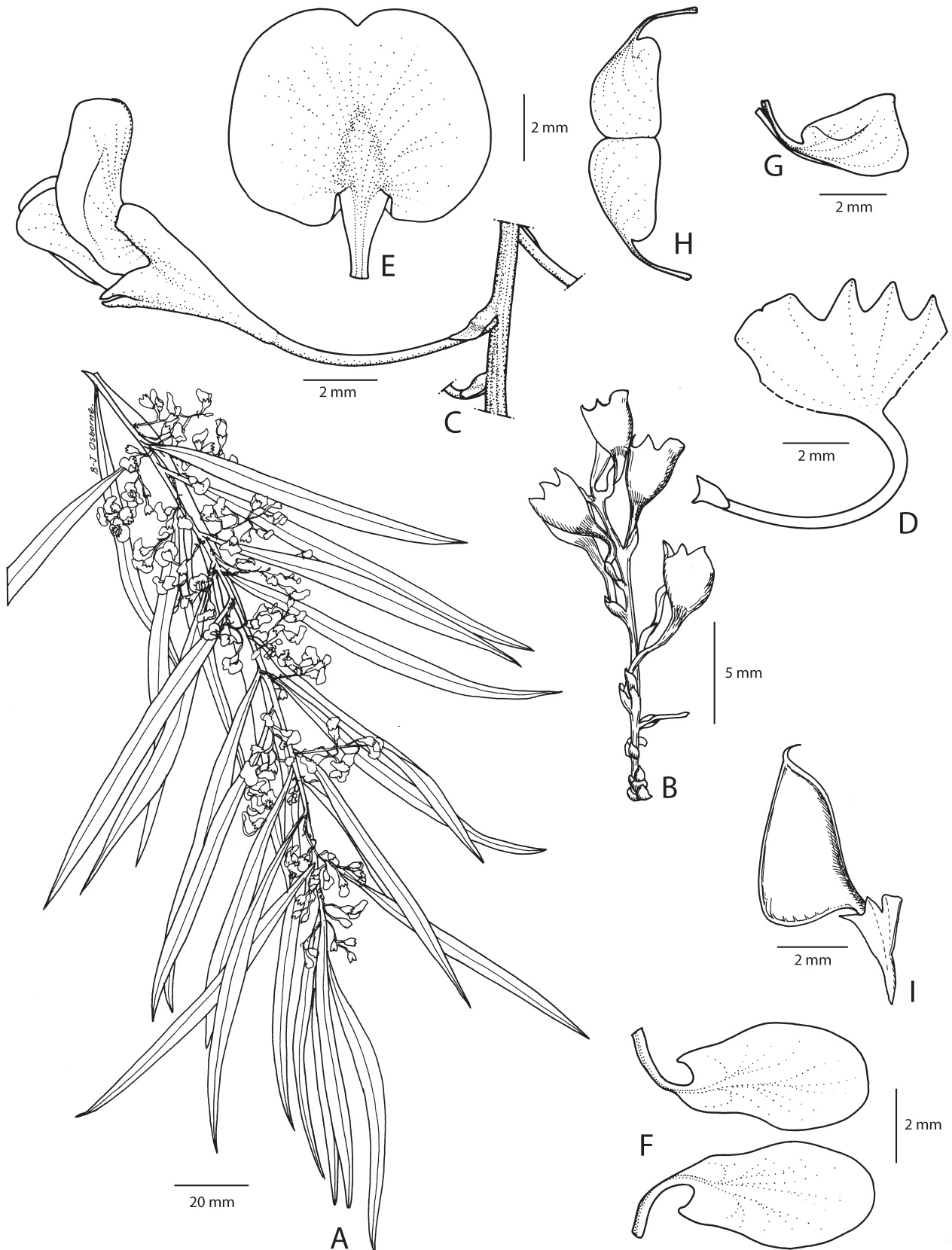
Specimens of *D. laevis* have often been misidentified as *D. mimosoides*. While the phyllodes of these species are similar, *D. mimosoides* can be distinguished by its corymbiform inflorescence with smaller (< 2 mm long) appressed subtending bracts and smaller flowers (e.g. standard 5.5–8 mm broad).

**Hybrids:**—*Daviesia laevis* × *D. leptophylla*.

**54. *Daviesia arborea*** W. Hill (1879: 65), W. Hill (1880: 22), Stanley & Ross (1983: 253), Crisp (1991a: 248), Crisp (1995: 1171), Crisp (2002: 524). *Daviesia corymbosa* Smith (1805: 507) var. *arborea* (W.Hill) Maiden (1898: 25)]. Type: 'occurring upon the Darlington Ranges'. Holotype: MEL 80930

*Daviesia arborea* F.Muell. & Scortech. ex Scortechini (1882: 221), *nom. illeg., non* W.Hill. Type: Logan River, *B. Scortechini* 136, 1881 (BRI 216486, MEL 77433 & 80933–4).

Glabrous *shrubs* or *small trees* with weeping branches, to 14 m tall; bark corky. *Root anatomy* unknown. *Branchlets* drooping, angular, ribbed. *Phyllodes* scattered, spreading at an acute angle, linear-elliptic, slightly curved, tapered to both ends, articulate at base, 40–200 × 3–12 mm, striate with fine parallel venation, thin, green, discolorous. *Unit inflorescences* 1(2) per axil, racemose, with 8–15 evenly spaced flowers; *peduncle* 2–4 mm long; *rachis* 8–23 mm long; *subtending bracts* appressed, subulate, 0.5–1 mm long. *Pedicels* 2–8 mm long. *Calyx* 4–5.5 mm long including 1.5–2.5 mm receptacle, lacking dark markings; upper 2 lobes united in a truncate, emarginate lip, ca. 1.5 mm long; lower 3 slightly shorter, triangular. *Corolla: standard* transversely broadly elliptic, emarginate, cordate, 7–8 × 7–8 mm including the 1.5–2 mm claw, pure yellow with fine red markings surrounding an intensely yellow spot at centre; *wings* obovate, rounded at apex, auriculate, ca. 7.5 × 3 mm including the 2 mm claw, yellow infused with dark red toward the base; *keel* half very broadly obovate, acute, saccate, auriculate, ca. 5 × 2 mm including the 2 mm claw, pale green with a red tip. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and discoid, subversatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and compressed, very broad oblong-ovoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly to very broadly obtriangular, ± acute, compressed, 7–9 × 4–5.5 mm, thin-walled, lead-grey to dark purple; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 54).



**FIGURE 54.** *Daviesia arborea*. A. Flowering branchlet. B. Inflorescence, flowers showing calyces only. C. Flower. D. Calyx opened out, upper lobes at left. E. Standard. F. Wings. G. Keel. H. Same, opened out. I. Pod. A, B from *Lebler s.n.* (BRI 147802); C–H from *Crisp 8308*; I from *Lebler s.n.* (BRI 147803). Drawn by B.-J. Osborne and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Flowering period:**—October to December. *Fruiting period:* December and January.

**Distribution:**—South-east Queensland and north-eastern New South Wales. Extends from the Bunya Mountains, north-west of Brisbane, southward to near Comboyne, New South Wales.

**Habitat:**—From coastal hills to mountain slopes and ridges, 50 to 1100 m in elevation, mostly on fine-textured soils, which may be derived from acid volcanic or metamorphic rocks. *Daviesia arborea* usually grows in wet sclerophyll forest dominated by tall eucalypts, *Syncarpia glomulifera* (Smith 1797: 269) Niedenzu (1893: 88) and *Lophostemon confertus* (Brown 1812: 417) Wilson & Waterhouse (1982: 424). It is sometimes found on rainforest margins or in dry sclerophyll forest.

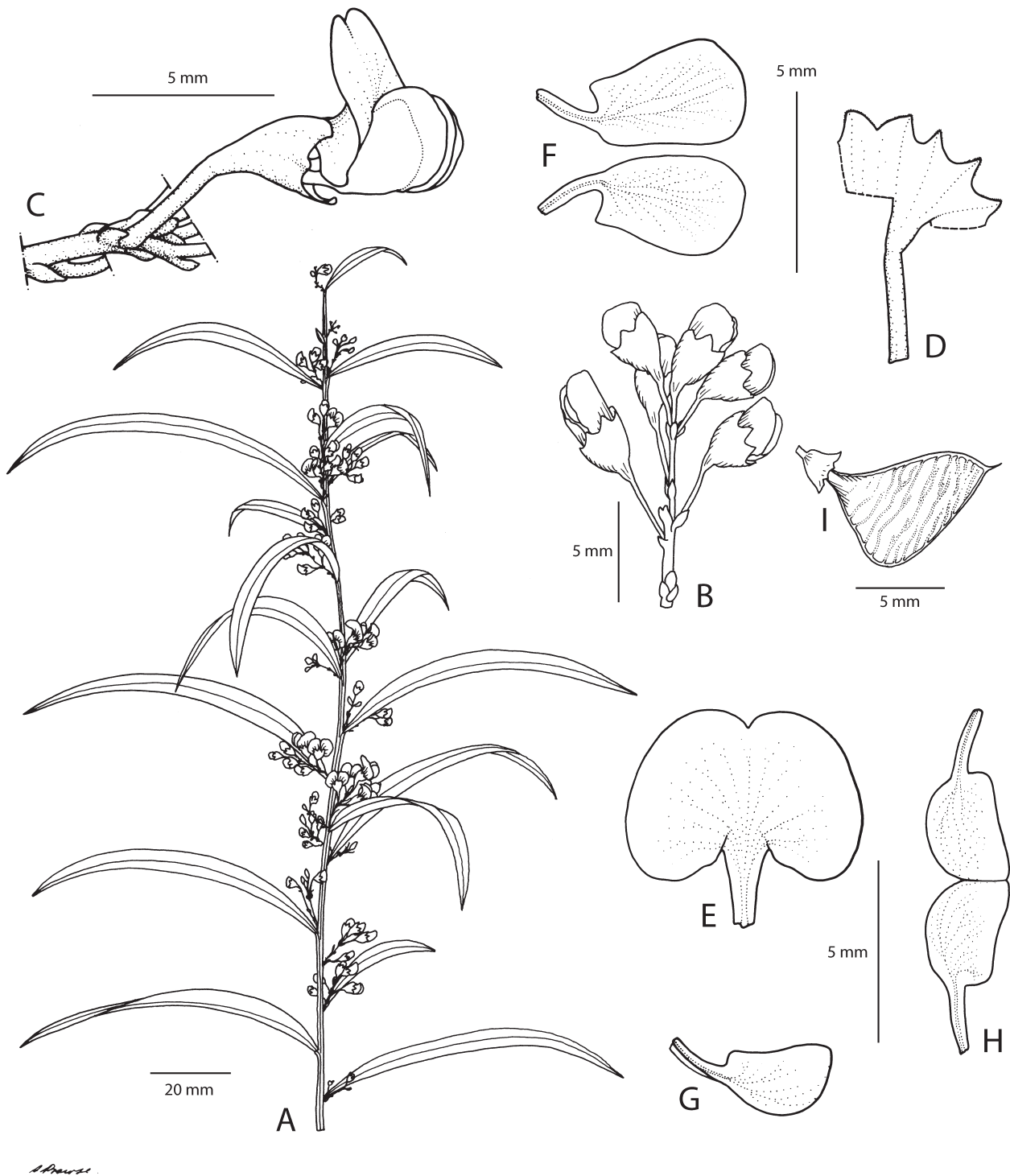
**Selected specimens (88 examined):**—**QUEENSLAND. Moreton:** Near North Tamborine, 27°55'S, 153°11'E, L.K. Bates 418, 12 November 1972 (BRI); D'Anguilar Range, 27°22'S, 152°46'E, I.R. Telford 9009 & G. Butler, 21 January 1983 (BISH, CBG, NSW); Beechmont Range, 28°02'S, 153°14'E, I.R. Telford 4134, 29 November 1979 (CBG, NSW); Mt Nebo, near Brisbane, 27°23'S, 152°47'E, B.A. Lebler s.n., November 1972 (BRI 147803); Mt Nebo, near Brisbane, 27°23'S, 152°47'E, B.A. Lebler s.n., 24 September 1972 (BRI 147802). **NEW SOUTH WALES. North Coast:** Near Comboyne East, 31°36'S, 152°29'E, E.F. Constable NSW 70265, 14 October 1961 (AD, MEL, NSW); Night Cap Range, Whian Whian State Forest, 18.6 km W of Mullumbimby, 28°34'S, 153°21'E, R. Coveny 4463 & A.N. Rodd, 4 September 1972 (BRI, CANB, MEL, NSW); Brunswick Heads Nature Reserve, 28°32'S, 153°34'E, R. Coveny 12432, W. Bishop & L. Murray, 16 December 1986 (CBG, NSW); Mistake State Forest, 30°43'S, 152°42'E, P. Gilmour 5897, 7 October 1986 (BISH, CBG, NSW); near Carrai State Forest, 30°59'S, 152°20'E, H.C. Hayes & D.J. McGillivray 2479, 24 October 1966 (NSW); Tellygram Range, 30°35'S, 152°21'E, J.B. Williams 685, November 1958 (NSW). **CULTIVATED.** Australian National Botanic Gardens, Canberra, M.D. Crisp 8308, 24 October 1989 (CBG); ex. Qld, Moreton, D'Anguilar Range (coll. I.R. Telford 9009).

**Affinity:**—With its unique combination of arborescent growth habit and corky furrowed bark, *D. arborea* should not be confused with any other species except perhaps *D. discolor*. These are sister taxa (Fig. 1A) and share a distinctive phyllode morphology with a long, tapering and usually curved outline, discolorous surfaces, thin texture, and raised but fine longitudinal venation. They also appear to have the same unique dark grey to purple colouring in the fruits, although we have only seen weathered pods in *D. discolor*. The latter species may be distinguished from *D. arborea* by its multi-stemmed, shrubby habit, its lack of furrowed, corky bark, its smaller racemes with the rachis less than 10 mm long and only three to eight flowers, and its upper two calyx lobes not forming a truncate lip.

*Daviesia laxiflora* and *D. suaveolens* are the only other consistently arborescent species in the genus. In contrast to *D. arborea*, neither species has corky bark and their venation is open and not parallel.

**55. *Daviesia discolor*** Pedley (1977: 34), Crisp (1991a: 250), Crisp (1995: 1188). Type: Queensland, Blackdown Tableland, R.J. Henderson H1026, L. Durrington & P. Sharpe, 6 September 1971. Holotype: BRI; isotypes: A, CANB, K, L, MO, NSW, PR

Multi-stemmed *shrubs* to 2 m high, glabrous. *Root anatomy* normal (unistelar). *Branchlets* ascending, angular, ribbed. *Phyllodes* ascending to widely spreading, linear-elliptic, ± falcate, tapered to both ends, articulate at base, 40–160 × 4–11 mm, striate with fine but raised, longitudinal, anastomosing venation, thin, green, discolorous. *Unit inflorescences* 1 or 2 per axil, racemose, 3–8-flowered; *peduncle* 1.5–6 mm long; *rachis* 1–4 mm long; *subtending bracts* ± appressed to pedicels, narrowly oblong or ovate, with margins strongly incurved, 0.8–1.1 mm long. *Pedicels* 1.5–3.5 mm long. *Calyx* 3.5–4.0 mm long including the 1.25–1.5 mm receptacle, lacking dark markings; lobes 0.5–1 mm long; upper 2 united higher than the lower 3 but scarcely forming a lip, very broadly triangular; lower 3 triangular, acute. *Corolla: standard* very broadly ovate, emarginate, cordate, 5.5–6 × 6.5–7.25 mm including the 1.5–1.75 mm claw, yellow with dull red infusion surrounding an intensely yellow bilobed spot at the centre; *wings* obovate-oblong, rounded at apex, auriculate, 5.5–6 × 2–2.5 mm including the 1.75–2 mm claw, yellow towards apex, dull red towards base; *keel* half very broadly obovate, scarcely acute, saccate, auriculate, ca. 4.5 × 2 mm including the 2.75 mm claw, pale green with a dull red tip. *Stamens* strongly dimorphic: inner whorl of 5 with longer, subterete filaments and compressed globose, subversatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and compressed, broadly ovoid-oblong, subbasifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, compressed, 7–8.5 × 5.5–6 mm, thin-walled, lead-grey or purple (weathered); upper suture nearly straight; lower suture acute. *Seed* not seen. (Fig. 55).



**FIGURE 55.** *Daviesia discolor*. A. Flowering branchlet. B. Inflorescence. C. Flower. D. Calyx opened out, upper lobes at left. E. Standard. F. Wings. G. Keel. H. Same, opened out. I. Pod. A, B from *Gittins 926*; C–H from *Crisp 7251*; I from *Crisp 2941*. Drawn by A.L. Prowse and D. Fortescue. Adapted from Crisp (1991a) with permission from CSIRO Publishing.

**Flowering period:**—August to October. *Fruiting period:* Unknown.

**Distribution:**—Endemic in Queensland, where it is known from three widely disjunct areas: on the Blackdown Tableland near Blackwater, in the Mt Walsh area near Biggenden, and north of Mt Playfair within Carnarvon National Park.

**Habitat:**—*Daviesia discolor* occurs on ridges, slopes and creek banks at elevations of 500 to 900 m, in sandy soil derived from sandstone and on lateritic clay soil. The associated vegetation is (often tall) open eucalypt forest,

dominated by species such as *Eucalyptus sphaerocarpa* Johnson & Blaxell (1972: 284), *E. acmenoides* Schauer (1843: 924), *Corymbia trachyphloia* (Mueller 1859a: 90) K.D.Hill & Johnson (1995: 227) and stringybarks, with an understorey of shrubs and sometimes hummock grass (*Triodia*).

**Conservation status:**—National: Vulnerable. Qld: Vulnerable.

**Selected specimens (15 examined):**—Approximate locality data given because the species is rare.

**QUEENSLAND. Leichhardt:** Blackdown Tableland, 23°50'S, 149°10'E, *M.D. Crisp 2941*, 11 June 1977 (CBG); *ibid.*, *C.H. Gittins 926*, August 1964 (BRI, CANB, NSW); *ibid.*, *H.G. Simmons 52*, September 1937 (BRI); *ibid.*, *R.J. Henderson H860*, *S.B. Andrews & P. Sharpe*, 26 April 1971 (BRI); *ibid.*, *I.R. Telford 9151 & G. Butler*, 27 January 1983 (CBG); alternate road to Tambo, 24°50'S, 146°50'E, *R.W. Purdie 4390*, 8 September 1993 (BRI, CBG); Carnarvon National Park, N of Mt Playfair Road, 24°50' S, 147°E, *M.D. Crisp 11732*, 31 August 2016 (BRI, CANB). **Wide Bay:** S of Mt Walsh, 25°50'S, 152°10'E, *J. Randall 420*, 2 October 1985 (BRI, CANB). **CULTIVATED.** Australian National Botanic Gardens, *M.D. Crisp 7251*, 16 August 1984 (CBG).

**Affinity:**—*Daviesia discolor* is the sister taxon of *D. arborea* and resembles it closely in most respects. The latter may be distinguished by its arborescent habit, corky bark, longer inflorescences (rachis 10–27 mm) with more flowers (8–15) and truncate upper calyx-lip. For a fuller discussion of this relationship, see under *D. arborea*.

**56. *Daviesia squarrosa*** Smith (1805: 507), Bentham (1864: 80), Crisp (1995: 1238), Crisp (2002: 526). Type: New South Wales, Port Jackson, *J. White*, 1793. Holotype: LINN; isotypes: B, BM (2 sheets), G, LIV, P, S

*Shrubs*, usually slender, to 1.5 m tall, ± hispid on branchlets, minutely so on midrib and margins of phyllodes. *Root anatomy* normal (unistelar). *Branchlets* arching, terete, ribbed. *Phyllodes* crowded, divaricate or reclinate, cordiform or ovate (rarely subulate or broad), acuminate with a long, tapering apex, somewhat undulate, cordate to rounded at base (rarely tapered, e.g. *Crisp 8277C*), 4–12 × 0.5–10 mm, midrib prominent above, venation reticulate or obscure, green or glaucous. *Unit inflorescences* 1(2) per axil, flowers solitary or 2 in umbels; peduncle 0.5–1(–3) mm long; *bracts* ascending, cuneate; *subtending bracts* 0.5–0.75 mm long, 0.3–0.4 mm broad. *Pedicels* 3.5–12 mm long. *Calyx* 2.5–3 mm long including the 0.5–0.75 mm receptacle; lobes acuminate; upper 2 lobes falcate, united higher and slightly broader than the lower 3, 0.5–1 mm long. *Corolla: standard* depressed-ovate, emarginate, reflexed, slightly auriculate, 5.5–5.6 × 6.6–7.2 mm including the 1.2–1.9 mm claw, with 2 calli at the base of the lamina, yellow with red markings around the rich yellow central spot; *wings* broadly obovate with a rounded and incurved apex, auriculate, 4.75–5.5 × 2.5–3 mm including the ca. 1.5 mm claw, red with or without yellow tips; *keel* half very broadly obovate, scarcely acute, auriculate, saccate, 4.25–4.5 × 2–2.25 mm including the 1.25–1.5 mm claw, red with or without a yellow tip. *Stamens* strongly dimorphic: inner whorl of 5 with longer, angular filaments and ovoid, dorsifixed anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and ovoid-oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely very shallowly obtriangular, acute or scarcely obtuse, compressed, 6–9 × 4–5.5 mm; upper suture strongly sigmoid; lower suture acute. *Seed* obovoid, somewhat compressed, 3.1–3.4 mm long, 1.7–2 mm broad, ca. 1.3 mm thick, brown with black mottling; *aril* ovoid, thickly lobed, 1.1–1.4 mm long. (Fig. 56).

**Chromosome number:**—2n = 18 (voucher Sands 639.5.1, cited as *D. squarrosa* var. *squarrosa* by Sands 1975).

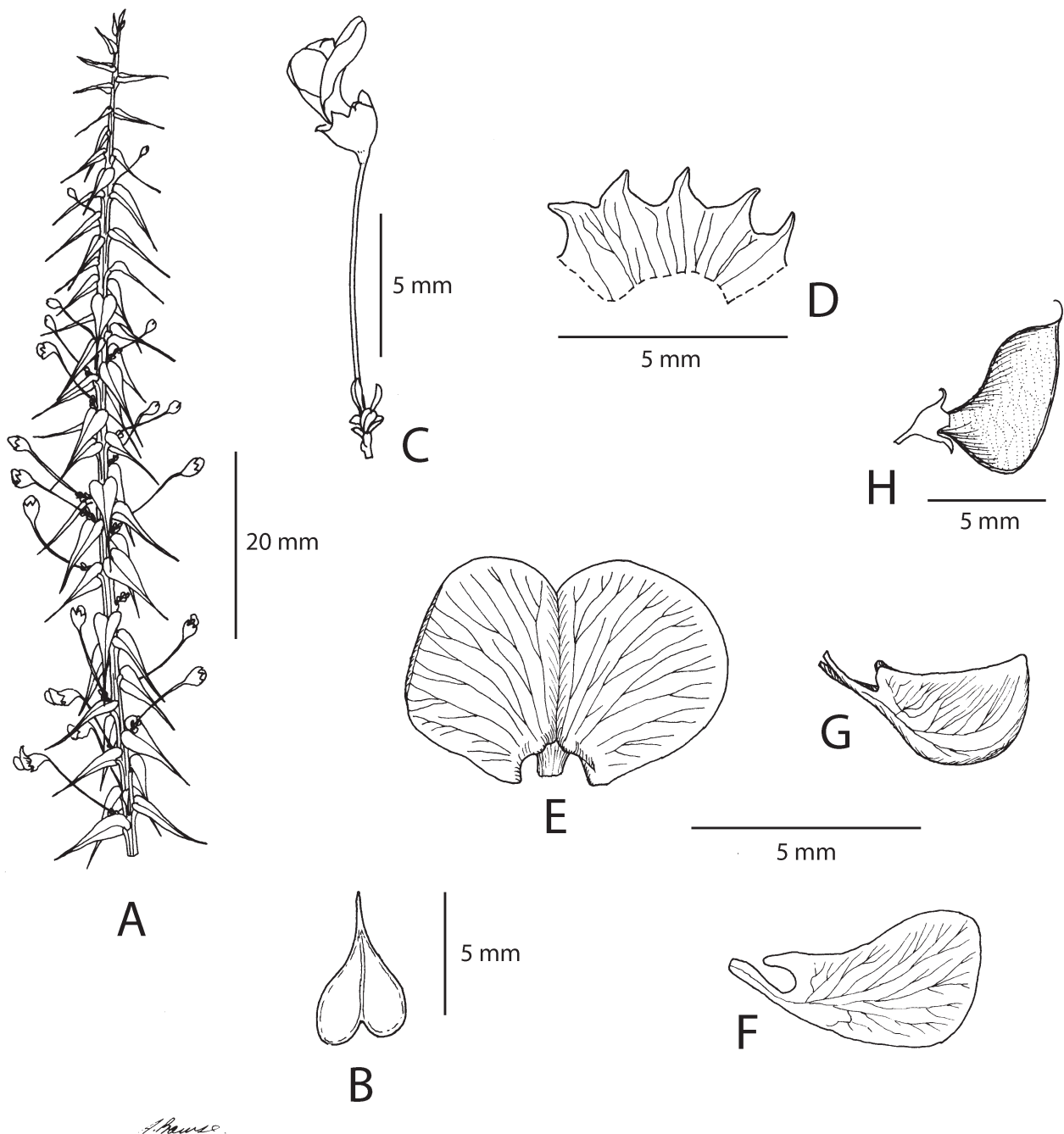
**Flowering period:**—July to October. *Fruiting period:* September to November.

**Distribution:**—Endemic to the coast and adjacent ranges of New South Wales, extending from near Newcastle southward to the Tuross River. Records from farther north (including Queensland) probably refer to *D. villifera*, which was previously included in *D. squarrosa* as a variety.

**Habitat:**—On skeletal soils derived from sandstone or metamorphic sediments, at low elevations. Associated vegetation is open forest dominated by eucalypts, with a sclerophyll shrub understorey.

**Selected specimens (72 examined):**—**NEW SOUTH WALES. North Coast:** Wallsend, 32°54'S, 151°40'E, *J.L. Boorman s.n.*, August 1906 (NSW 35407); Oakhampton, 32°42'S, 151°34'E, *Anon. s.n.*, October 1911 (NSW 35413). **Central Tablelands:** Megalong Valley, tributary of Megalong Creek, 33°44'S, 150°16'E, *M.D. Crisp 8277A–F & I.R. Telford*, 22 Apr 1989 (CBG, NSW). **Central Coast:** Port Jackson, 33°50'S, 151°17'E, *Anon. s.n.*, *sine die* (ex Herb. *O.W. Sonder*: MEL 80408); 0.5 km S of Thirlmere along railway line, 34°13'S, 150°34'E, *M.D. Crisp 4681 & I.R. Telford*, 27 November 1978 (CBG); Grose Vale, 33°35'S, 150°39'E, *L. Fraser s.n.*, 11 August 1934 (NSW 35393); St Marys, 33°47'S, 150°47'E, *A.A. Hamilton s.n.*, October 1897 (BRI 231441A); Putty Road, 61 km S of Singleton, 32°46'S, 150°43'E, *D.W. Shoobridge s.n.*, 27 July 1961 (AD, CBG 855). **Southern**

**Tablelands:** Ca. 9 km WSW of Nerriga, 35°07'S, 149°59'E, *M.D. Crisp 11680*, 26 April 2015 (CANB). **South Coast:** Runnyford Road, Nelligen, 35°39'S, 150°08'E, *M.D. Crisp 6739*, 4 October 1980 (BRI, CBG, MEL, NSW); 16 km N of Batemans Bay, 35°35'S, 150°15'E, *V.E. Sands 639.5.1*, 14 September 1963 (PERTH, SYD).



**FIGURE 56.** *Daviesia squarrosa*. A. Flowering branchlet. B. Phyllode, adaxial view. C. Inflorescence (1-flowered). D. Calyx opened out, upper lobes at left. E. Standard. F. Wing. G. Keel. H. Pod. A, C from *Anon.* (MEL 80408); B, D–G from *Crisp 6739*; H from *Crisp 4681*. Drawn by A.L. Prowse and M.D. Crisp. Adapted from Crisp (1990) with permission from CSIRO Publishing.

**Affinity:**—*Daviesia squarrosa* is most similar to *D. nova-anglica*, which has a similar keel shape and distribution of hairs. The latter species may be distinguished by its larger upper bracts (1–1.5 mm long and 0.5–0.75 mm broad), somewhat larger flowers (e.g. standard 6–7 mm long), truncate upper calyx-lobes, and differently shaped phyllodes, which are ovate rather than heart-shaped. *Daviesia villifera* and *D. quoquoversus* differ from *D. squarrosa* by their falcate, strongly beaked keel-petals and truncate upper calyx-lobes, and *D. pubigera* differs in having non-cordate phyllodes and hairs present all over the vegetative parts.

**57. *Daviesia villifera*** A.Cunn. ex Bentham (1837a: 12), Crisp (1990: 247), Crisp (1995: 1244), Crisp (2002: 527). *Daviesia squarrosa* Smith (1805: 507) var. *villifera* (A.Cunn. ex Benth.) Bentham (1864: 80). Type: 'In collibus dumosis prope Moreton Bay. A. Cunningham...(v.s.)'. Lectotype (Crisp 1990: 247): Bushy hills vicy. of Moreton Bay, N.S. Wales, [*A. Cunningham*], 1824 (W); isolectotype: BM, K (3 specimens on 2 sheets ex Herb. Hooker), CGE, ?G

Open *shrubs* commonly 1.5–2 m high; hispid all over vegetative parts, usually including the phyllode lamina. *Root anatomy* unknown. *Branchlets* arching, terete, ribbed. *Phyllodes* crowded, divaricate or reclinate, broadly to narrowly ovate or somewhat cordiform, acuminate with a long, tapering, pungent apex, undulate, basally subcordate to cuneate, articulate, 5–10(–12) × 2–6 mm, green, midrib prominent above, venation reticulate, often obscure. *Unit inflorescences* 1(2) per axil, flowers solitary or 2 in an umbel; *peduncle* 0.5–1.1 mm long; *bracts* ascending, oblong or narrowly oblong; *subtending bracts* 0.4–0.8 mm long, 0.25–0.45 mm broad. *Pedicels* 1.5–8.5 mm long. *Calyx* 2.4–2.9 mm long including 0.6–0.8 mm receptacle; lobes ca. 0.6 mm long; upper 2 united in a truncate emarginate lip; lower 3 broadly triangular. *Corolla: standard* reflexed, depressed-ovate, emarginate, scarcely auriculate, ca. 5.0 × 5.75 mm including the 1–1.5 mm claw, 2 small calli present at the base of the lamina, yellow with a thin red jagged line (expanding basally) surrounding the rich yellow bilobed central spot; *wings* obovate, apex rounded to nearly truncate and incurved, scarcely enclosing the keel, auriculate, ca. 5 × 2.5 mm including the 1.5 mm claw, yellow distally, dark red towards base; *keel* narrowly ovate, strongly falcate (almost U-shaped), beaked, slightly auriculate, slightly saccate, ca. 4.75 × 1.5 mm including the 1.5 mm claw and 1.25 mm beak, dull red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and very broad-ovoid, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, broad-ovoid, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly to very shallowly obtriangular, acuminate, compressed, 9–11 × 5–7 mm; upper suture strongly sigmoid; lower suture scarcely acute to scarcely obtuse. *Seed* obovoid, compressed, ca. 3.6 mm long, ca. 1.9 mm broad, ca. 0.9 mm thick, red-brown; *aril* thickly lobed, ca. 1.7 mm long. (Fig. 57).

**Chromosome number:**—2n = 18 (voucher Sands 639.5.1, cited as *D. squarrosa* var. *villifera* by Sands 1975).

**Flowering period:**—June to October; mainly August and September. **Fruiting period:** September and October.

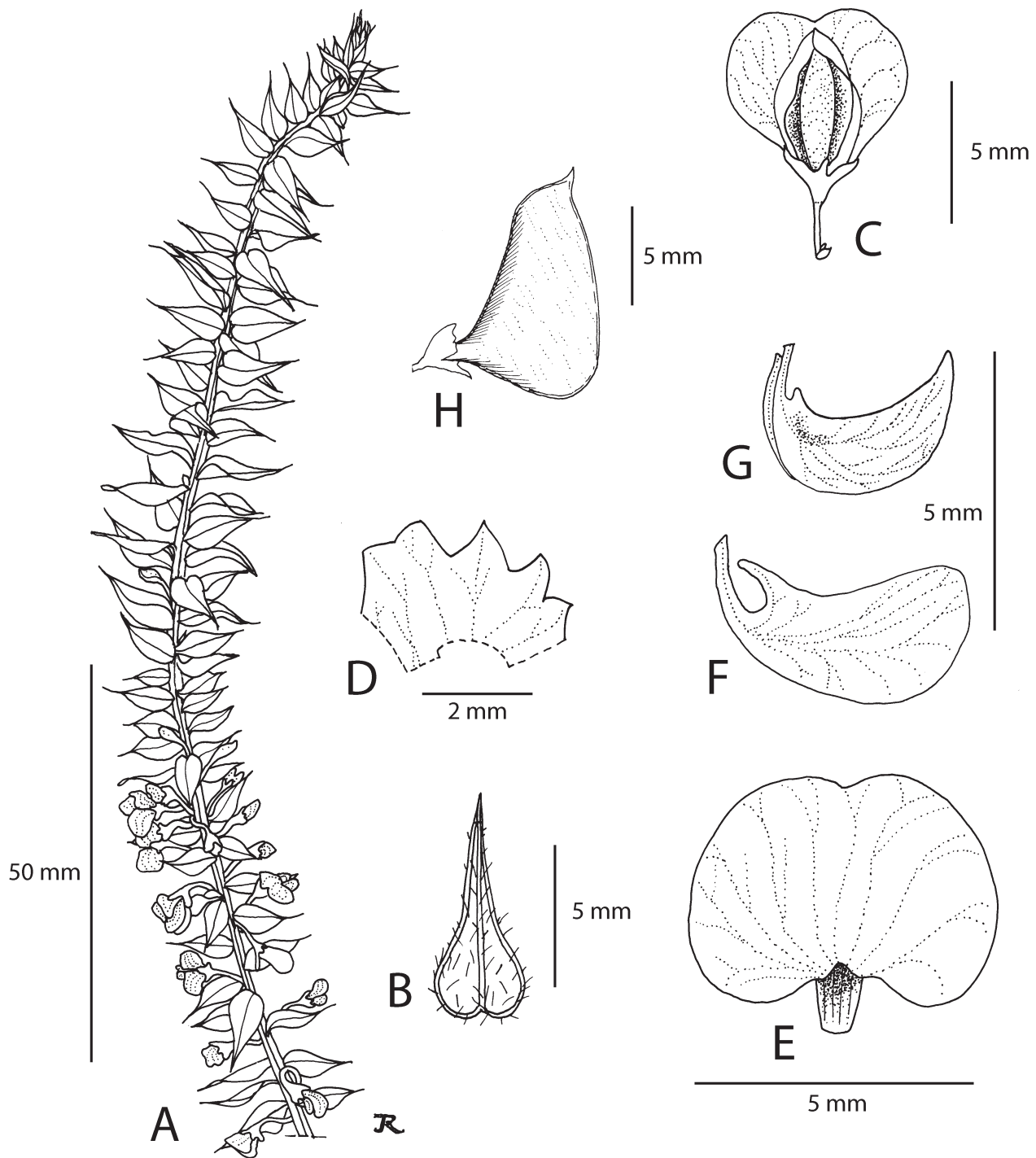
**Distribution:**—Mainly in south-eastern to central Queensland, from Brisbane north-west to the Mt Playfair area; also around Grafton on the north coast of New South Wales.

**Habitat:**—Generally on hilly terrain, usually on skeletal, sandy to clay soils derived from sedimentary rocks, especially sandstone. Associated vegetation is typically open forest dominated by eucalypts such as *Corymbia citriodora* (Hook. in Mitchell 1848: 235) K.D. Hill & Johnson (1995: 388).

**Selected specimens (45 examined):**—**QUEENSLAND: Leichhardt:** Carnarvon National Park, 450 m N of Mt Playfair Road at 24.7 km W of turnoff from Salvator Rosa access road, 24°46'S, 146°56'E, *M.D. Crisp 11734*, 31 August 2016 (BRI, CANB). **Mitchell:** Bull Creek Gorge area, ca. 24°40'S, 146°40'E, *B.O'Keefe 651*, 20 September 1984 (BRI). **Leichhardt:** Isla Gorge, ca. 29 km SW of Theodore, 25°09'S, 149°57'E, *S.L. Everist 8030*, 28 September 1968 (BRI, MEL, NSW). **Burnett:** Ironpot Creek, 40 km W of Kingaroy, 26°40'S, 151°25'E, *R. Croll s.n.*, 27 June 1968 (MEL 0080419A). **Moreton:** Everton Hills, Henderson Road, 27°23'S, 152°58'E, *M.D. Crisp 7833 & I.R. Telford*, 29 August 1986 (BRI, CBG); 10 km N of Helidon, 27°30'S, 152°09'E, *B. Muffet M5/303*, 6 September 1975 (CBG); Griffith University site, Kessels Road, Mt Gravatt, 27°32'S, 153°02'E, *P. Sharpe 785*, 20 September 1973 (BRI); Dinmore Pottery, 27°36'S, 152°50'E, *L.S. Smith 12175*, 19 October 1964 (BRI); Tamborine Mt, 27°55'S, 153°10'E, *C.T. White 7139*, 27 September 1930 (BRI). **NEW SOUTH WALES. North Coast:** Gwydir Hwy, 39 km from Grafton towards Glen Innes, 29°36'S, 152°35'E, *M.D. Crisp 7389 & I.R. Telford*, 1 October 1984 (BRI, CBG, NSW).

**Affinity:**—*Daviesia villifera* is similar to all members of the *D. squarrosa* group, but differs from all other members except *D. pubigera* in its abundant hispid hairs on the vegetative parts, particularly the lamina of the phyllode. *Daviesia pubigera*—and its close relative *D. filipes*, which is usually hispid but occasionally glabrous—are easily distinguished from *D. villifera* by their narrowly ovate or oblong phyllodes with ± recurved margins and a keel which is neither falcate nor beaked. In *D. quoquoversus*, *D. nova-anglica* and *D. squarrosa*, the phyllode is glabrous except on the midrib and margins. The closest relative of *D. villifera* is probably *D. quoquoversus*, with which it shares a distinctive beak on the keel (lacking in *D. nova-anglica* and *D. squarrosa*). *Daviesia*

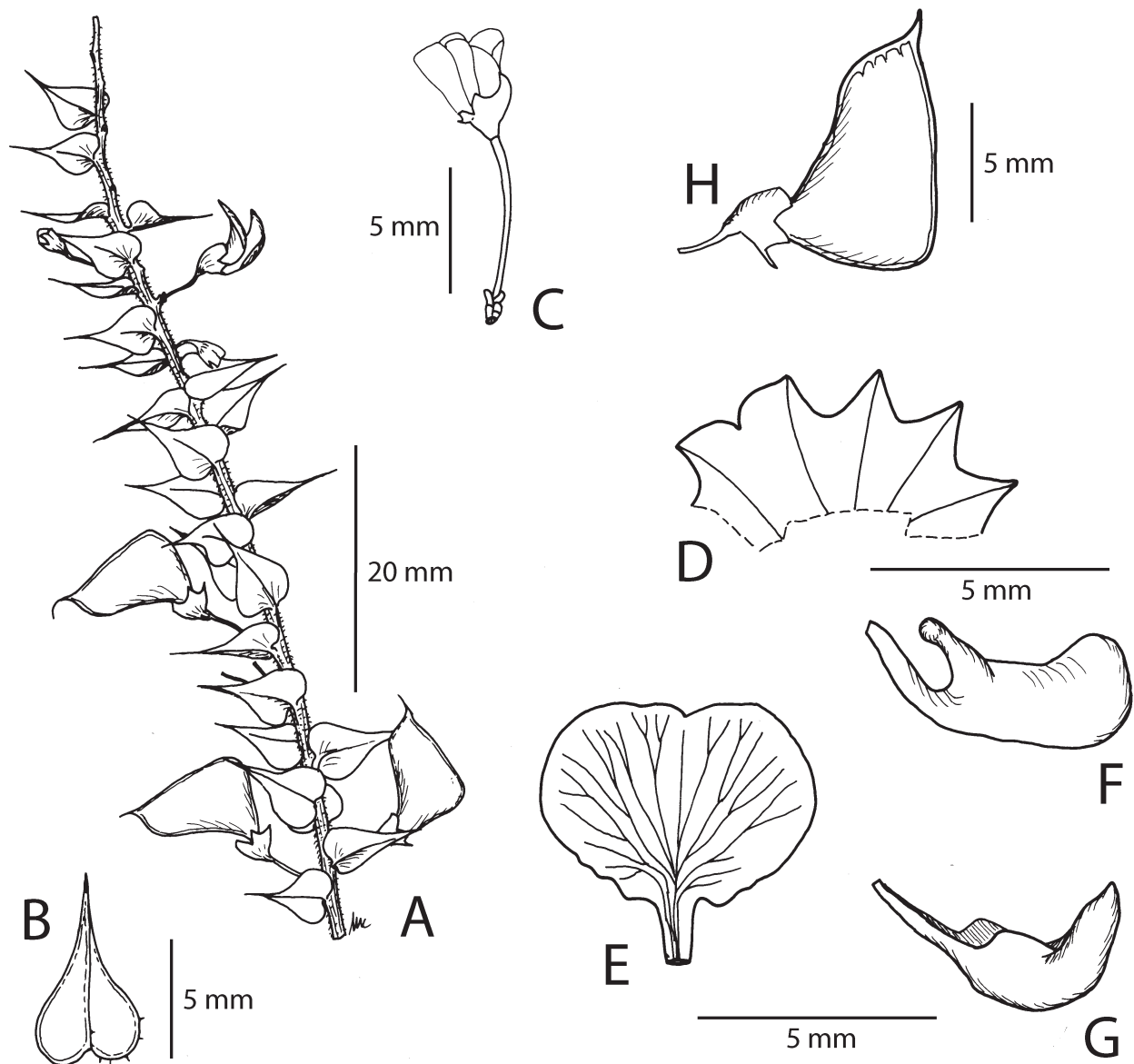
*quoquoversus* differs in having irregularly bent hairs on the branchlets, as well as in lacking hairs on the phyllode lamina.



**FIGURE 57.** *Daviesia villifera*. A. Flowering branchlet. B. Phyllode, adaxial view. C. Inflorescence (1-flowered). D. Calyx opened out, upper lobes at left. E. Standard. F. Wing. G. Keel. H. Pod. A from *Crisp 7833*; B from *Muffet M5/303*; C–G from *Crisp 7389*; H from *Everist 8030*. Drawn by J. Rosenberg and A.L. Prowse. Adapted from Crisp (1990) with permission from CSIRO Publishing.

**58. *Daviesia quoquoversus*** Crisp (1990: 249), Crisp (1995: 1226). Type [approximate locality data given because the species is rare]: Queensland, Leichhardt, Blackdown Tableland, 23°50'S, 149°00'E, *R.J. Henderson 1060*, *L. Durrington & P. Sharpe*, 7 September 1971. Holotype: BRI; isotypes: CANB, MEL, NSW





**FIGURE 58.** *Daviesia quoquoversus*. A. Branchlet in flower and fruit. B. Phyllode, adaxial surface. C. Inflorescence (1-flowered). D. Calyx opened out, upper lip at left. E. Standard. F. Wing. G. Keel. H. Pod. A, E–H from *Henderson 1060* (type); B from *Crisp 2968*; C, D from *Pearson 300*. Drawn by M.D. Crisp. Adapted from Crisp (1990) with permission from CSIRO Publishing.

Diffuse *shrubs* to 2 m high; hispid on branchlets, scarcely so on midribs and margins of phyllodes, the hairs bent or twisted in every direction. *Root anatomy* unknown. *Branchlets* arching, terete, ribbed. *Phyllodes* crowded, divaricate or reclinate, ovate, broadly ovate or cordiform, acuminate with a long tapering pungent apex, undulate, basally cordate or truncate, articulate, 6–9 × 2.5–6 mm, green; midrib prominent above; venation usually conspicuous, reticulate. *Unit inflorescences* 1(2) per axil, flowers solitary or (rarely) 2 in umbels; peduncle 0.5–1.1 mm long; *bracts* ascending, broadly to very broadly obovate; *subtending bracts* 0.3–0.5 mm long, 0.3–0.6 mm broad. *Pedicels* 3.1–6.2 mm long. *Calyx* 2.8–3.1 mm long including ca. 0.5 mm receptacle; lobes 1–1.25 mm long; upper 2 united in a truncate emarginate lip; lower 3 very broadly triangular. *Corolla* yellow with red markings; *standard* reflexed, transversely elliptic, scarcely emarginate, auriculate, 5.5–6 × 6–6.25 mm including the 1.5–2 mm claw; *wings* obovate-oblong, rounded and incurved at apex, prominently auriculate at the base, 5.5–6 × 2–2.5 mm including the 1.5–2 mm claw; *keel* falcately ovate, almost narrow, beaked, scarcely saccate and auriculate at the base, ca. 5.75–6 × 1.5 mm including ca. 2.25 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and versatile, discoid anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and basifixed, ovoid, 2-celled anthers; filaments free. *Pod* obliquely very shallowly

obtriangular, acuminate, compressed, 9–10(–12) × 6–7 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 58).

**Flowering period:**—July to September. *Fruiting period:* From September.

**Distribution:**—Known only from the Blackdown Tableland in the Expedition Range, Queensland.

**Habitat:**—Occurs on the plateau summit, at elevations of 600–900 m, on sandy soil derived from sandstone. Associated vegetation is open forest dominated e.g. by *Eucalyptus baileyana* Mueller (1878: 37) and *Corymbia bunites* (Brooker & Bean 1991: 423) K.D.Hill & Johnson (1995: 373), together with sclerophyll shrubs such as *Banksia* and *Ricinocarpos* Desfontaines (1817: 459).

**Conservation status:**—National: Not listed. Qld: Vulnerable.

**Additional specimens examined:**—Approximate locality data are given because the species is rare.

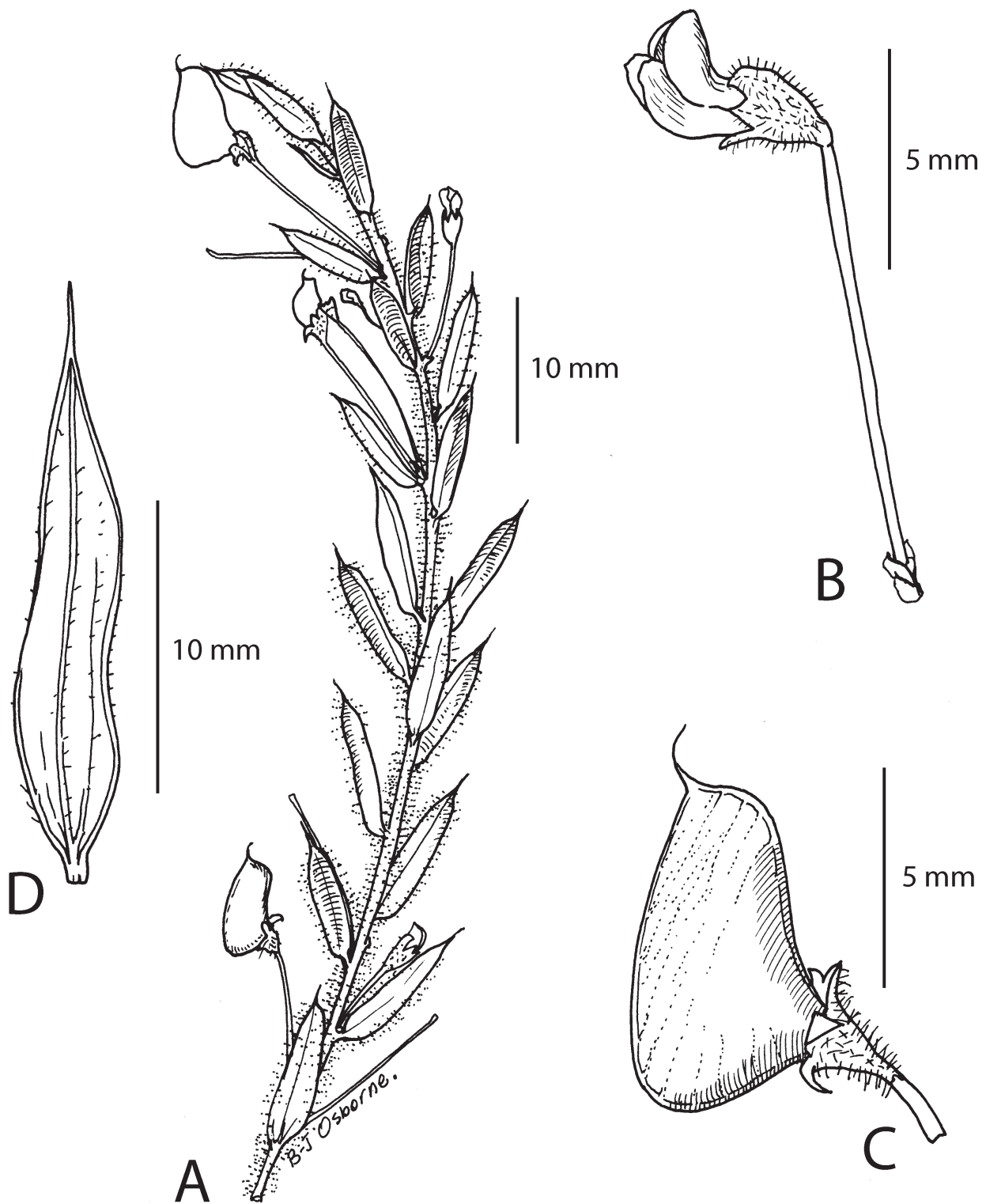
**QUEENSLAND. Leichhardt:** Blackdown Tableland, 23°50'S, 149°E, *M.D. Crisp* 2968, 12 June 1977 (CBG); *ibid.*, *R.J. Henderson* 874, *S.B. Andrews & P. Sharpe*, 27 April 1971 (BRI); *ibid.*, *S.G. Pearson* 300, 1 August 1981 (BRI).

**Affinity:**—*Daviesia quoquoversus* appears to be closely related to *D. villifera*, with which it shares a distinctively beaked, falcate keel-petal. However, *D. villifera* differs in bearing straight, hispid hairs abundantly all over the vegetative parts, including the lamina of the phyllode. *Daviesia squarrosa* and *D. nova-anglica*, although possessing a differently shaped keel, have a glabrous phyllode lamina, like that of *D. quoquoversus*. In those species, however, the hairs are straight, quite unlike the bent and twisted hairs of *D. quoquoversus*. *Daviesia pubigera* and *D. filipes* are similar to *D. quoquoversus* in being more or less hispid but differ in having narrowly ovate or oblong phyllodes with more or less recurved margins and the keel is neither falcate nor beaked.

**59. *Daviesia filipes*** Benth. in Mitchell (1848: 363), Bentham (1864: 80), Stanley & Ross (1983: 254), Crisp (1995: 1193). Type: Not designated, but from the text one can determine: Collector—Mr. Drysdale, storekeeper. Date—between 30 May & 19 October 1846. Locality—near 2nd Depot, by R. Maranoa just W of Mt. Sowerby, ca. 26°13'S, 148°06'E. Lectotype (Crisp 1995: 1193): Subtropical New Holland, Camp 29, *Lieut. Col. Sir T.L. Mitchell* 558, 15 September 1846 (K, ex Herb. Bentham); isolectotype: BM, CGE (2 sheets), K (ex Herb. Hooker)

*Daviesia longipes* Domin (1926: 723). Type: 'Queensland: Sandsteinhuegel der Dividing Range bei Pentland (DOMIN II. 1910).' Lectotype (Crisp 1995: 1193): Queensland, in collibus arenaceis montium Dividing Range apud opp. Pentland, *K. Domin* 4442, February 1910 (PR 527026). Syntype: same locality, *K. Domin* 4441, February 1910 (PR 527025). Note: This is a trivial variant, differing from typical *D. filipes* only in being glabrous; the species varies considerably in the density of the indumentum and complete glabrousness is only one extreme.

*Shrubs* to 1.5 m high, hirsute, hispid or villous on vegetative parts, rarely glabrous. *Root anatomy* normal (unistelar). *Branchlets* terete, ascending or arching. *Phyllodes* fairly crowded, ascending at ca. 45°, mostly narrowly oblong, occasionally tapered to either end, rarely broader, apically acuminate and pungent, with recurved to ± flat margins, rounded to cuneate and articulate at the base, (6–)9–19 × 1.5–6 mm. *Unit inflorescence* 1 per axil, umbellate, 1(–3)-flowered, with or without compound, terminal, raceme- or umbel-like inflorescences, which are due to the suppression of the phyllodes, 1–5-flowered; *peduncle* 0.5–9 mm long; *barren basal bracts* forming an involucre, ca. 0.25 mm long; *subtending bracts* appressed, oblong, ca. 0.5 mm long. *Pedicel* 4–12 mm long, hooked. *Calyx* 2.5–3 mm long including the ca. 0.5 mm receptacle; upper 2 lobes united in a broad, truncate lip or united higher than the lower 3 and broadly triangular, ca. 1 mm long, scabrous; lower 3 lobes triangular, ca. 0.75 mm long. *Corolla* yellow with red markings or rarely pure yellow (*Crisp* 11731); *standard* broadly obovate to very broadly so, emarginate, 4.5–5 × 3.5–4 mm including the ca. 1.5 mm claw, yellow with 2 dull red basal blotches either side of the central, intensely yellow 'eyes'; *wings* obovate with a rounded apex, auriculate, 4.5–5 × 1.5 mm including the 1–1.5 mm claw, yellow infused with dull maroon towards the base; *keel* half elliptic, acute, auriculate, saccate, 4.5–5 × 1.5 mm including the 1.5–2 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, somewhat compressed, 7–9 × 4–5 mm; upper suture sigmoid; lower suture ca. 90°. *Seed* globose to fusiform, 3.2–4 mm long, 1.7–2.2 mm broad, 1–1.4 mm thick, dark to light brown with or without black mottling; *aril* 1.2–1.7 mm long. (Fig. 59).



**FIGURE 59.** *Daviesia filipes* subsp. *filipes*. A. Fertile branchlet. B. Flower. C. Pod. *Daviesia filipes* subsp. *terminalis*. D. Phyllode that is glabrous except along nerves. A–C from *Crisp* 2747; D from *Staples* 100874/4. Drawn by B-J. Osborne.

**Flowering period:**—April to November. *Fruiting period:* April to November.

**Distribution:**—Queensland, from drier inland slopes of the ranges of the wet tropics (e.g. Davies Creek and Windsor Tableland) south to Inglewood in the Darling Downs.

**Habitat:**—In eucalypt-dominated open forest or woodland on plateaux, ridges or moderate to steep slopes. Soils are sandy or loamy, often with gravel, and derived from sandstone or granite.

**Affinity:**—*Daviesia pubigera* is very similar to *D. filipes*, replacing it in New South Wales in the equivalent habitats of the western slopes of the Great Dividing Range. *Daviesia pubigera* differs in having an inflorescence rachis (the portion at base bearing bracts) that is hispid and proportionally longer, being about equal to or longer than the pedicel (portion above highest bract). Also, the flowers are somewhat larger in *D. pubigera*, e.g. the calyx including the stipe-like receptacle is 2.8–3.3 mm long. *Daviesia umbellulata* can have narrow phyllodes resembling those of *D. filipes*, and some plants have terminal inflorescences as in *D. filipes* subsp. *terminalis*. However *D. umbellulata* differs in having generally longer phyllodes (7–30 mm long), a greater number of flowers per unit inflorescence (3–6), shorter pedicels (4.5–5 mm long) and larger flowers (e.g. calyx 3–3.5 mm long, standard 5–7 × 5–7.5 mm).

**59a. *Daviesia filipes* Benth. subsp. *filipes***

*Phyllodes* mostly narrowly oblong, occasionally tapered to either end, rarely broader, acuminate, pungent, with margins recurved, 6–19 × 2–5 mm, hispid (rarely glabrous). *Unit inflorescence* 1 per axil, flowers solitary or 2 in an umbel, lacking compound, terminal inflorescences; *peduncle* 1–3 mm long. *Pedicels* 4–12 mm long. *Calyx* with upper 2 lobes united in a broad, truncate lip, or (rarely) united higher than the lower 3 and broadly triangular; lower 3 lobes triangular. *Corolla: standard* not auriculate. (Fig. 59A–C).

**Flowering period:**—June to November. *Fruiting period:* June to November.

**Distribution:**—Queensland, from the White Mountains near Torrens Creek through the central Qld sandstone ranges to Inglewood in the Darling Downs.

**Selected specimens (25 examined):**—QUEENSLAND. **Burke:** Burra Range, 2.5 km from Great Divide crest along Flinders Highway towards Torrens Creek, 20°44'S, 145°13'E, *I.R. Telford 11454*, 5 May 1994 (CBG). **Burnett:** 31 km S of Boyne River crossing, Mundubbera to Durong road, 25°56'S, 151°09'E, *P.I. Forster 5633*, 23 August 1989 (BISH, BRI, CANB, DNA, MEL, MO). **Leichhardt:** Carnarvon National Park, 22 km W along Mt Playfair Road from turnoff on Salvator Rosa access road, 24°45'S, 146°57'E, *M.D. Crisp 11731*, 30 August 2016 (BRI, CANB); Carnarvon Range, 25°15'S, 148°35'E, *C.T. White 11334*, 26 September 1940 (BRI). **Mitchell:** 20 km E of Jericho, 23°38'S, 146°18'E, *A.D. Chapman 1267*, 20 July 1975 (CBG, BRI, K, L). **Port Curtis:** Many Peaks Range, ca. 40 km SE of Gladstone, 2 km WSW of Mt Castletower, 24°10'S, 151°17'E, *M.D. Crisp 2747*, 2 June 1977 (CBG, BRI, NSW, PERTH, L). **Darling Downs:** Inglewood, 28°25'S, 151°05'E, *C.T. White s.n.*, November 1922 (BRI AQ0019443).

**Affinity:**—Differs from subsp. *terminalis* mainly in lacking compound, terminal, racemose or paniculate inflorescences.

**59b. *Daviesia filipes* Benth. subsp. *terminalis* Crisp & G.Chandler, subsp. nov.**

Differs from subsp. *filipes* in having terminal inflorescences, which are due to the suppression of the phyllodes, and can be simple or compound, appearing racemose or even paniculate, with 1 or more flowers. Simple inflorescences are also present in lower phyllodes axils, as in subsp. *filipes*.

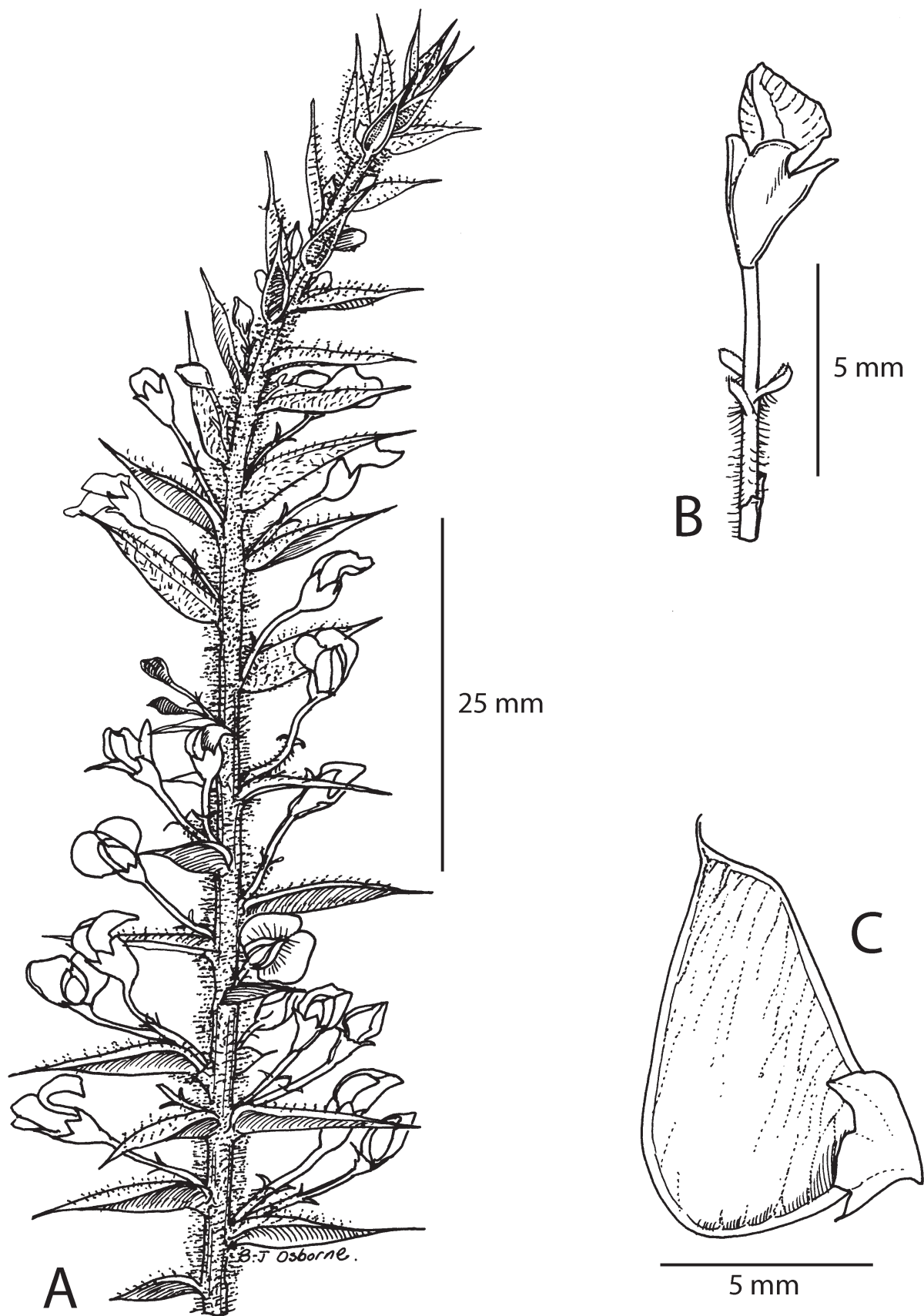
Type: QUEENSLAND: Cook: Davies Creek Gorge, 16 km E of Mareeba, 4.5 km along Davies Creek Road from Kennedy Highway, 16°59'S, 145°33'E, *I.R. Telford 12046*, 7 July 1994. Holotype: CBG; isotypes: AD, BISH, BRI, MEL, NSW, QRS.

*Shrubs* to 1.5 m tall. *Phyllodes* narrow-ovate to -elliptic or -oblong, occasionally broader, apex acuminate, pungent, base cuneate to rounded, 8–14 × 2–6 mm; hispid (rarely glabrous). *Unit inflorescences* 1 per axil, 1(–3)-flowered; terminal, compound, raceme- or umbel-like, 1–5-flowered inflorescences, are also present due to the suppression of the uppermost phyllodes; *peduncles* 0.5–9 mm long. *Pedicels* 4–8 mm long. *Calyx* with upper 2 lobes united higher than the lower 3, triangular; lower 3 lobes triangular. *Corolla: standard* slightly auriculate. (Fig. 59D).

**Flowering period:**—April to September. *Fruiting period:* April to September.

**Distribution:**—Queensland, drier slopes of the ranges in the wet tropics (e.g. Davies Creek and Windsor Tableland).

**Selected specimens (11 examined):**—QUEENSLAND. **Cook:** Top of Wild River Gorge [near] Ravenshoe, 17°36'S, 145°29'E, *M.E. Clements 1665*, 16 July 1979 (CBG); Stannary Hills, 17°19'S, 145°13'E, *T.L. Bancroft s.n.*, August 1908 (BRI AQ0259595); Davies Creek falls, ca. 17°01'S, 145°35'E, *I.B. Staples 100874/4*, 10 August 1974 (QRS 509).



**FIGURE 60.** *Daviesia pubigera*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A, B from *Crisp* 3225; C from *Boorman* s.n. (NSW 35369). Drawn by B.-J. Osborne.

**60. *Daviesia pubigera*** A.Cunn. ex Benth (1837a: 11), Crisp (1995: 1226), Crisp (2002: 526). *Daviesia umbellulata* Smith (1805: 507) var. *pubigera* (A.Cunn. ex Benth.) Benth (1864: 75). Type: 'In uliginosis Novae Cambriae australis interioris. A. Cunningham (v.s.). Lectotype (Crisp 1995: 1226): Bogy [sic], N. Western interior, New South Wales, A. Cunningham 20, 1826 (W); isolectotype: BM, G (2 sheets), K (annotated 'Negative no. Kew 915')

*Daviesia recurvata* Maiden & Baker (1896: 582). Type: 'Taloobie, Bylong Creek, Goulburn River, N.S.W. (R.T.B.)' Holotype: CBG.

Open to spreading *shrubs*, 0.7–2 m high, hirsute on branchlets, scabrous to hirsute on phyllodes. *Root anatomy* unknown. *Branchlets* spreading at 45°, terete, ribbed. *Phyllodes* moderately crowded, divaricate to slightly antrorse, narrowly ovate, apically acuminate and pungent, margins recurved, cuneate to rounded at base, articulate, 5–14 × 1–4.5 mm. *Unit inflorescences* 1 or 2 per axil, 1-flowered; *peduncle* 2.5–5 mm long, hispid; *barren bracts* oblong, keeled, spreading at tips, 0.5–1 mm long; *subtending bracts* oblong, keeled, spreading at tips, ca. 1 mm long. *Pedicels* 2–4 mm long. *Calyx* 3–3.5 mm long including the 0.75–1 mm receptacle; upper 2 lobes united in a truncate emarginate lip, ca. 1.5 mm long; lower 3 lobes triangular, recurved, ca. 1 mm long. *Corolla: standard* broadly to transversely elliptic, emarginate, slightly auriculate, 5.5–7 × 4–7 mm including the ca. 1.5 mm claw, with 2 thickened calli at the base of the lamina, yellow with a thin red ring surrounding the bilobed yellow centre; *wings* obovate with a rounded apex, enclosing the apex of the keel, auriculate, 5.5–6.5 × 2.3–2.6 mm including the ca. 1.5 mm claw, red; *keel* elliptic, acute, auriculate, saccate, 4.5–5 × 2.3–2.5 mm including the ca. 1.5 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly to very shallowly obtriangular, acute, 8–9 × 6–6.5 mm; upper suture strongly sigmoid; lower suture acute. *Seed* globose, 4.6–5 mm long, ca. 2.7 mm broad, 1.8–2 mm wide, light brown with black mottling; *aril* ca. 1.8 mm long. (Fig. 60).

**Flowering period:**—October to December. **Fruiting period:** October to December.

**Distribution:**—New South Wales, mainly along the western slopes from the Queensland border south to Boorowa, which is not far north of Canberra.

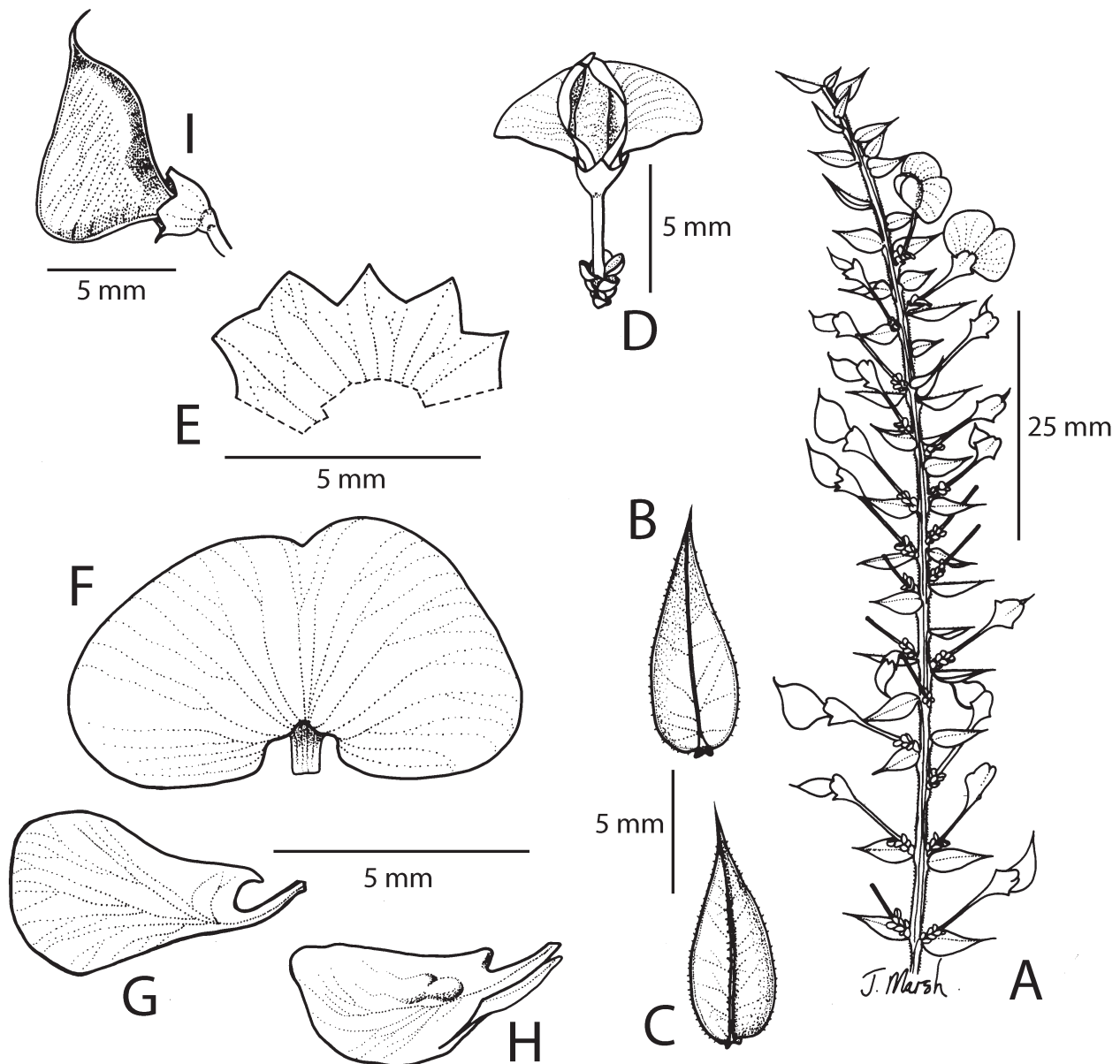
**Habitat:**—Grows in sandy soils over sandstone on low hills or steep rocky slopes, in eucalypt-dominated open forest and heathland, with *Acacia* and *Callitris*.

**Selected specimens (25 examined):**—**NEW SOUTH WALES. North-west Slopes:** Warialda, 29°32'S, 150°34'E, *J.L. Boorman s.n.*, October 1914 (NSW 35369); Warrumbungle Range, 2.4 km SW of Mt Scabilon, 31°18'S, 149°01'E, *M.D. Crisp 3225 & D. Verdon*, 3 October 1977 (BRI, CBG, NSW); south of Woodsreef, 30°25'S, 150°44'E, *J.R. Hosking 1230A & J.J. Bruhl*, 11 December 1995 (CANB, MEL, NSW, NE). **Central-west Slopes:** Newell Highway, 17.5 km N of Dubbo, 32°07'S, 148°35'E, *J.H. Willis s.n.*, 9 October 1969 (MEL 0080590A). **Central Tablelands:** 4 km from Currant Mtn Gap towards Kelgoola, 32°52'S, 150°13'E, *G. Butler 955*, 1 October 1979 (CBG).

**Affinity:**—*Daviesia pubigera* is most likely to be confused with *D. filipes*, which replaces it in equivalent habitats of the drier slopes of the Great Dividing Range, throughout Queensland. *Daviesia filipes* differs in having a glabrous peduncle that is shorter than the pedicel(s), being 0–9 mm long. Also, the flowers are a little smaller than in *D. pubigera*, e.g. the calyx including the stipe-like receptacle is 2.5–3 mm long. *Daviesia pubigera* also resembles *D. villifera*, which differs in having broadly ovate phyllodes with a long-acuminate apex (3–7 mm long), and has a beaked, falcate keel. The other species within this group (*D. nova-anglica*, *D. quoquoversus* and *D. squarrosa*, and occasionally some specimens of *D. villifera*) have glabrous phyllode laminae, where *D. pubigera* is hispid all over the plant. *Daviesia squarrosa* also differs in having mostly cordate phyllodes, and *D. quoquoversus* has a distinctly beaked, falcate keel.

**61. *Daviesia nova-anglica*** Crisp (1990: 245), Crisp (2002: 526). Type: New South Wales, Northern Tablelands, ca. 23 km E of Tenterfield, 8.5 km from Timbarra along road to Poverty Point, 29°04'S, 152°15'E, *M.D. Crisp 7336 & I.R. Telford*, 29 September 1984. Holotype: CBG; isotypes: BRI, K, MEL, MO, NSW

*Shrubs* 0.5–1(–2) m high, hispid on branchlets, minutely so on midrib and margins of phyllodes. *Root anatomy* unknown. *Branchlets* arching, terete, ribbed, hispid. *Phyllodes* fairly crowded, ± divaricate, ovate or narrowly so,



**FIGURE 61.** *Daviesia nova-anglica*. A. Branchlet late in flowering. B. Phyllode, abaxial view. C. Phyllode, adaxial view. D. Inflorescence (1-flowered). E. Calyx opened out, upper lobes at left. F. Standard. G. Wing. H. Keel. I. Pod. A–C from *Crisp 8247*; D–H from *Crisp 7336* (type); I from *Green 2734*. Drawn by J. Marsh. Adapted from Crisp (1990) with permission from CSIRO Publishing.

rarely broad, acute or acuminate at apex, pungent,  $\pm$  recurved at margins, subcordate to rounded at base, articulate,  $5\text{--}14 \times 2.5\text{--}7$  mm, green; midrib prominent above; venation obscure. *Unit inflorescences* 1 per axil, flowers solitary or 2 in umbels; *peduncle* 0.8–4.0 mm long; *barren basal bracts* ascending, oblong; *subtending bracts* ascending, oblong, 1–1.5 mm long, 0.5–0.75 mm broad. *Pedicels* 3–6.25 mm long. *Calyx* 2.5–3 mm long including 0.5–0.8 mm receptacle; lobes ca. 0.75 mm long; upper 2 united in a truncate emarginate lip; lower 3 broadly triangular. *Corolla*: *standard* depressed-ovate, emarginate, scarcely auriculate and with slight calli at the base,  $6\text{--}7 \times 7.5\text{--}8.5$  mm including the 1–1.5 mm claw, yellow with maroon infusion surrounding an oblong or bilobed central yellow spot; *wings* obovate, rounded and incurved at apex, auriculate at the base,  $5.5\text{--}6.5 \times 2.5\text{--}3$  mm including the ca. 1.5 mm claw, yellow at the tips and margins with maroon infusion towards the base; *keel* half very broadly ovate, acute, auriculate, saccate, ca.  $5 \times 2\text{--}2.5$  mm including the ca. 1.5 mm claw, maroon. *Stamens* dimorphic though filaments are uniform in length; inner whorl of 5 with terete filaments and versatile, round, smaller anthers with confluent thecae; outer whorl of 5 with compressed filaments and larger, basifixed, 2-celled anthers; filaments

free. *Pod* obliquely shallowly obtriangular, acute, compressed, 6.5–8 × 5–6 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 61).

**Chromosome number:**— $n = 9$ ,  $2n = 18$  (voucher Sands 628.2.12, cited under *D. squarrosa* var. *squarrosa* by Sands 1975).

**Flowering period:**—August to October. *Fruiting period:* November.

**Distribution:**—Known only from New South Wales, where it occurs mainly along the eastern escarpment of the Northern Tablelands from near Tenterfield in the north to the headwaters of the Hastings River in the south; also recorded near Warialda on the North-west Slopes. This species possibly occurs in Queensland because one population (*Crisp 7310*) is only 1 km from the state border.

**Habitat:**—Grows in sandy soils, usually derived from granite, at elevations of 500–1000 m. Associated vegetation is open forest dominated by eucalypts, with a sclerophyll shrub understorey; less commonly occurring in woodland or heath.

**Selected specimens (26 examined):**—**NEW SOUTH WALES. North-west Slopes:** 3 km from Warialda, ca. 29°03'S, 150°34'E, *Anon.*, 15 October 1960 (NE 32450). **Northern Tablelands:** 1 km along road to Stanthorpe (Qld) from turn-off 0.5 km N of Wilsons Downfall on Mt Lindesay Hwy, 28°41'S, 152°04'E, *M.D. Crisp 7310 & I.R. Telford*, 28 September 1984 (BRI, CBG, NSW); Gibraltar Range, 1 km S of Boundary Trig, 29°33'S, 152°16'E, *M.D. Crisp 7369 & I.R. Telford*, 29 September 1984 (CBG, NSW); Werrikimbe Trail, Werrikimbe National Park, 31°10'S, 152°16'E, *P. Gilmour 5909*, 14 October 1986 (CBG); Gibraltar Range, *J.W. Green 2734*, 25 November 1960 (NE); Gibraltar Range State Forest, 29°35'S, 152°13'E, *V.E. Sands 628.2.12*, 2 August 1962 (SYD); Forbes River, Mt Boss State Forest, 51 km NW of Wauchope, 31°06'S, 152°21'E, *H. Streimann 8212*, 20 October 1978 (CBG, K, NSW). **CULTIVATED.** Australian National Botanic Gardens, section 55, no. 8410698 (ex Gibraltar Range), *M.D. Crisp 8247*, 20 October 1988 (CBG, NSW).

**Affinity:**—Specimens of *Daviesia nova-anglica* were once referred to *D. squarrosa* var. *squarrosa* (= *D. squarrosa*). *Daviesia squarrosa* may be distinguished most readily by its smaller upper bracts (0.5–0.8 mm long and 0.3–0.4 mm broad). Phyllode shape also differs in these species, although the distinction is more subtle. In *D. squarrosa*, the phyllodes are basically heart-shaped with a pronounced cuspidate apex 3–5 mm long, whereas in *D. nova-anglica*, they are basically ovate with a shorter, acuminate apex up to 4 mm long. *Daviesia villifera* and *D. pubigera* differ from both these species in being hispid all over the phyllodes, and *D. villifera* is further differentiated by the hooked, beaked keel-petal.

**62. *Daviesia umbellulata*** Smith (1805: 507), Bentham (1864: 75), Stanley & Ross (1983: 253), Crisp (1995: 1243), Crisp (2002: 526). *Daviesia ulicina* Sm. var. *umbellulata* (Sm.) Wawra von Fernsee (1883: 14). Type: [Port Jackson]. Holotype: 'New South Wales, [ex Herb.] *J. Banks*, 1798' (LINN); isotype: LIV

*Daviesia racemulosa* Candolle (1825: 114). Type: '...in Nova-Hollandia...(v.s. sine fr.)'. Holotype: G-DC.

*Daviesia concinna* R.Br. ex Bentham (1864: 75). Type: 'Queensland. Rock hills, Pine Port, R. Brown. N.S.Wales. Hastings river; Beckler (Herb. R.Br. and F.Muell.)'. Lectotype (Crisp 1995: 1243): In collibus saxosis prope Pine Port, Herb. R. Brown no. 4066 (BM); isolectotype: CANB, E, K (part of a sheet). Syntype: Hastings R., *Dr. Beckler* (MEL).

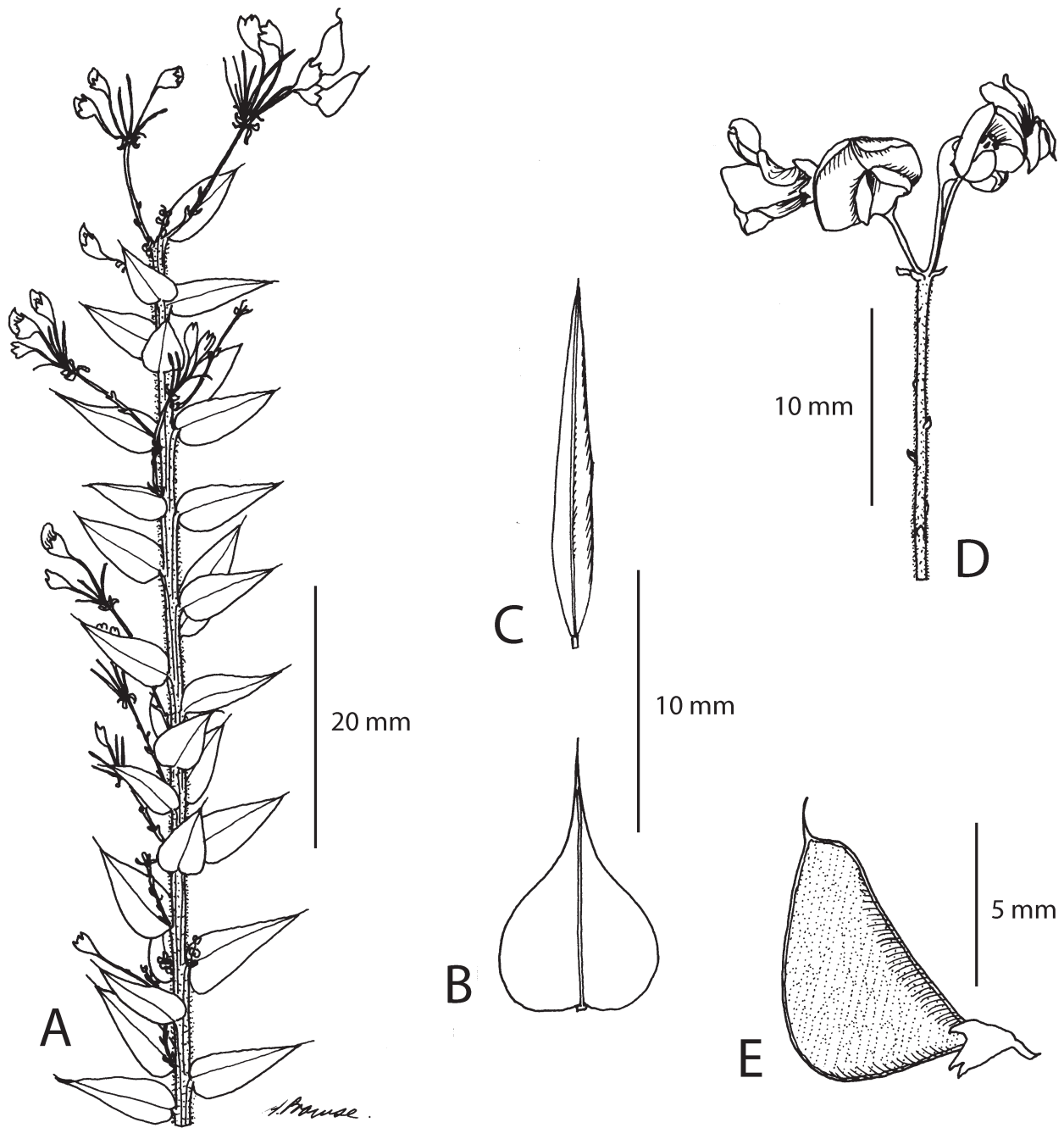
*Daviesia umbellulata* Sm. var. *dietrichiae* Domin (1926: 723). Type: 'Sud-Queensland: Brisbane River, *A. Dietrich* s.n.' Lectotype (Crisp 1995: 1243): US; isolectotype: AD, B, CANB, LD, PR, PRC.

[*Chorizema genistifolia* Hereman (1868: 181)—*nom. inval.*, given as a synonym of *D. racemulosa*.]

**Nomenclatural note:**—Labillardière (1805) misapplied the name *D. ulicifolia* to *D. umbellulata* Sm. and compounded the error with a misspelling ('*umbellata*'). Labillardière was followed by several authors using both spellings until Bentham (1864) corrected the misapplication. The synonymies of *D. ulicifolia* in Crisp (1995) and in this monograph detail these misapplications. Current flora treatments accept the name *D. umbellulata* Sm. and treat it separately from *D. ulicifolia* (e.g. Stanley & Ross 1983, Crisp 2002).

Slender *shrubs* 0.3 to 1 m tall, glabrous or hirsute on branchlets, to scabrous on phyllodes. *Root anatomy* unknown. *Branchlets* terete, ribbed. *Phyllodes* fairly crowded, divaricate or somewhat retrorse, ovate, narrowly so or linear, rarely narrowly elliptic, apically acuminate and pungent, basally cordate to rounded or cuneate, articulate, 7–30 × 0.5–8 mm, glabrous to scabrous. *Unit inflorescences* usually axillary, rarely terminal (Torrington and Palm Beach areas only). *Axillary inflorescences* umbellate or occasionally (e.g. Torrington and Palm Beach areas) racemose with leaf-like bracts grading into more typical bracts, solitary, 3–6-flowered; *peduncle* 3–50 mm long;





**FIGURE 62.** *Daviesia umbellulata*. A. Branchlet in late stage of flowering. B, C. Phyllodes in adaxial view, showing variation. D. Inflorescence. E. Pod. A from Harrold 136; B from Gauba s.n. (CBG 2712); C, E from White s.n., 26 October 1916 (BRI); D from Crisp 1326. Drawn by A.L. Prowse.

*rachis* < 1 mm long (up to 5 mm in the Torrington and Palm Beach areas). *Terminal inflorescences* racemose with leaf-like bracts that grade into more typical bracts; *peduncle* (including leafy portion) 35–105 mm long; *rachis* 1–6 mm long. *Barren basal bracts* numerous, broadly oblong to obovate, keeled or not, spreading at the tips, to ca. 0.75 mm long, or sometimes leaf-like (Torrington and Palm Beach areas); *subtending bracts* keeled or not, oblong, spreading at the tips, to 1 mm long. *Pedicels* 4–5.5 mm long. *Calyx* 3–3.5 mm long including the 0.5–1 mm receptacle; upper 2 lobes united in a truncate lip, ca. 1 mm long; lower 3 lobes triangular, < 1 mm long. *Corolla: standard* transversely ovate, emarginate, 5–7 × 5–7.5 mm including the 1–2 mm claw, with 2 calli at the base of the lamina, pale yellow to pale orange-yellow with a faint to very dark maroon infusion surrounding the pale yellow, usually bilobed central spot; *wings* obovate with a rounded apex, auriculate, 4.5–6 × 2–2.5 mm including the 1–1.5

mm claw, yellow at the apex and margins, infused with maroon towards the base; *keel* half transverse-obovate, apically acute to scarcely obtuse, auriculate, saccate, 4–4.5 × 1.5–2.5 mm including the 1–2 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, rounder, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, somewhat compressed, 8–10 × 4–6 mm, upper suture sigmoid; lower suture ca. 90°. *Seed* not seen. (Fig. 62).

**Flowering period:**—August to December. *Fruiting period:* September to December.

**Distribution:**—Mainly near the coast from Shoalwater Bay in Queensland to Sydney, New South Wales, with a disjunct inland population near Torrington, New South Wales.

**Habitat:**—Grows mostly in sandy soils over clay or granite, though occasionally in loamy soils, in the understorey of eucalypt-dominated open forest and woodland or in *Banksia*-dominated heathland. One population occurs inland at moderate elevation (ca. 1,000 m), in the Torrington area of northern NSW.

**Selected specimens (100 examined):**—**QUEENSLAND. Wide Bay:** Ca. 0.5 km N of Torbanlea School on road to Hervey Bay, 25°21'S, 152°36'E, *D.L. Jones 6345 & B.E. Jones*, 30 August 1990 (BRI, CANB); 23.6 km from Rainbow Beach towards Gympie, 25°59'S, 152°59'E, *M.D. Crisp 10328 & D.C. Morris*, 8 October 2006 (CANB, NSW). **Moreton:** 1.6 km NE of Landsborough, 26°47'S, 153°09'E, *J.H. Ross 3177*, 30 August 1986 (BRI, CANB, HO, MEL, NSW); 6 km from Woodford along road to Beerburrum, 26°47' S 152°50' E, *M.D. Crisp 2655*, 26 May 1977 (CBG). **NEW SOUTH WALES. Northern Tablelands:** Torrington State Conservation Area, Blatherarm Creek campground vicinity, 29°14'S, 151°42'E, *M.D. Crisp 11693*, 31 January 2016 (CANB); 12 km from Torrington towards Silent Grove, 29°14'S, 151°42'E, *J.A. Armstrong 664*, 27 November 1973 (NSW); S of Torrington, ca. 29°19'S, 151°41'E, *E. Gauba s.n.*, 13 December 1951 (CBG 2712). **North Coast:** 1 km from Coutts Crossing toward Armidale, 29°50'S, 152°53'E, *M.D. Crisp 7392 & I.R. Telford*, 1 October 1984 (CBG, NSW, MEL); ca. 2 km S of Angourie, 29°31'S, 153°21'E, *I.R. Telford 8957 & G. Butler*, 20 January 1983 (CBG). **Central Coast:** Palm Beach, 40 km N of Sydney, 33°36'S, 151°19'E, *E.H. Ising s.n.*, September 1962 (AD 96243151); *ibid.*, *M.D. Crisp 9302*, 19 August 2001 (CANB). **CULTIVATED.** Australian National Botanic Gardens, Canberra, *M.D. Crisp 1326*, 30 October 1975 (CBG).

**Affinity:**—*Daviesia umbellulata* resembles *D. filipes* subsp. *terminalis*, which also has terminal inflorescences, but differs in having generally shorter phyllodes (6–19 mm long), a smaller number of flowers per inflorescence (1–3), no leaf-like bracts on the peduncle, longer pedicels (4–12 mm long) and smaller flowers (e.g. calyx 2.5–3 mm long, standard 4.5–5 × 3.5–4 mm).

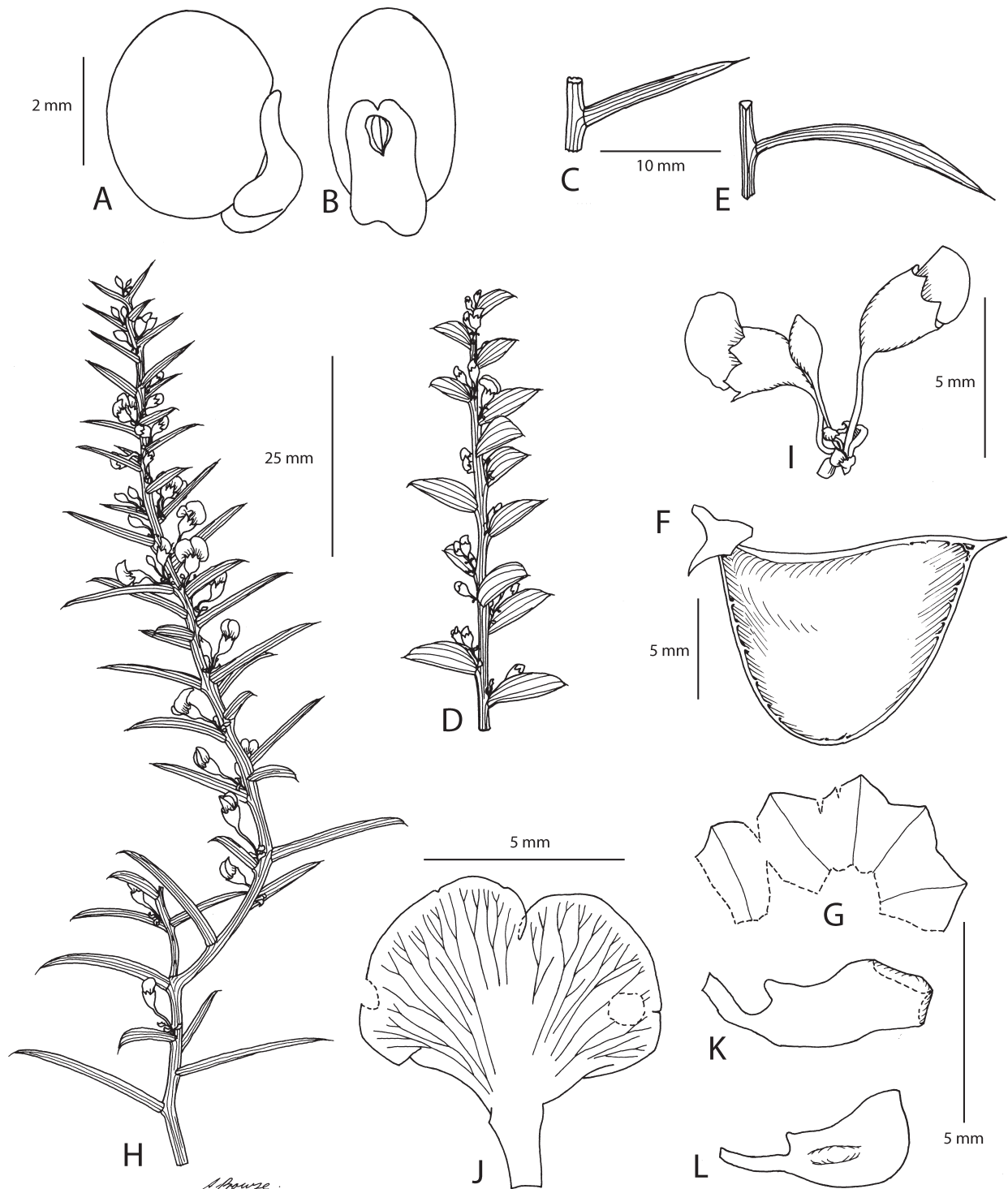
This species has been confused with *D. ulicifolia*, though they are not closely related (Fig. 1A). Despite a superficial similarity between the narrow-leaved forms of these species, *D. ulicifolia* is readily distinguished by its calyx, which has 5 uniform 10-ribbed lobes with incurved tips, whereas *D. umbellulata* has a strongly zygomorphic calyx with a truncate upper lip, no ribs and straight to slightly recurved tips. Also, *D. ulicifolia* has spinescent branchlet tips, unlike *D. umbellulata*. See also the nomenclatural note above.

**Variation:**—Specimens from the disjunct inland population near Torrington (NSW) have cordate phyllodes (Fig. 62B), leaf-like bracts (cf. Palm Beach material), inflorescences that appear almost terminal on lateral shoots, and a later flowering and fruiting period, though this could be due to a higher elevation. These characters are plastic and lacking in some Torrington-area plants, while some specimens from coastal areas (e.g. Palm Beach) have some or all of these characters. In the molecular phylogeny (Fig. 1A), *D. umbellulata* forms a clade (bootstrap = 89), with the accession from Palm Beach (*Crisp 9302*) being sister to the accession from the Torrington area (*Crisp 11693*).

## VII. Cord-Rooted Clade

**63. *Daviesia asperula*** Crisp (1982b: 55), Crisp (1995: 1174), Craigie (2015: 28). Type: South Australia, Kangaroo Island, 6–7 miles [10–11 km] from Rocky River, towards Cape Borda, *M.E. Phillips s.n.*, 29 September 1965. Holotype: CBG 21582; isotype: AD

Compact or spreading *shrubs*, to 2 m high, minutely scabrid on vegetative parts. *Root anatomy* with anomalous secondary thickening (cord-rooted). *Branchlets* with multiple longitudinal ribs. *Phyllodes* often crowded, spreading, recurved at least at base, vertically compressed, either subulate or obliquely falciform to obliquely narrowly obovate,



**FIGURE 63.** *Daviesia asperula* subsp. *asperula*. A, B. Seed, lateral (L) and hilar (R) view. C. Phyllode. *Daviesia asperula* subsp. *obliqua*. D. Flowering branchlet. E. Phyllode. F. Pod. G. Calyx opened out, upper lobes at left. H–L. Intermediate between subspecies. H. Flowering branchlet. I. Inflorescence. J. Standard. K. Wing. L. Keel. A, B from Choo 13; C from Phillips s.n. (CBG 21582), D, G from Whibley 1944; E from P.G. Wilson 357; F from Brown s.n. (MEL 80939); H–L from Donner 2094. Drawn by A.L. Prowse and M.D. Crisp. Adapted from Crisp (1980a) with permission from the Board of the Adelaide Botanic Gardens.

pungent, articulate at base, 5–25 × 1–4.5 mm, striate with parallel nerves even when fresh; stipules minute (ca. 0.5 mm), broadly triangular, dark red. *Unit inflorescences* 1 per axil, racemose, 2–3-flowered; *peduncle* up to 1 mm long; *rachis* almost nil. *Pedicels* 1–2 mm long. *Calyx* campanulate, 2.5–3 mm long including the 0.5 mm receptacle;

lobes subequal, very short (< 0.5 mm long). *Corolla: standard* very broadly ovate, emarginate, 7–8 × 7–8 mm including the ca. 1 mm claw, orange or yellow-orange with a circular deep red spot surrounding a central vertical rich yellow streak; *wings* narrowly obovate, auriculate, ca. 5.5 × 2 mm including the 1.5–2 mm claw, orange-red, darker toward base; *keel* half very broadly obovate, shortly beaked, auriculate, saccate, ca. 4.5 × 2 mm including the 1.5–2 mm claw, orange-red. *Stamens* slightly dimorphic with filaments ca. equal in length; anthers all 2-celled and basifixed, inner 5 shorter and round, outer 5 with longer, oblong; filaments free. *Pod* obliquely shallowly obtriangular, acute, somewhat compressed, 10–14 × 7–10 mm; upper suture sigmoid; lower suture acute, sharply curved. *Seed* broadly ovoid-ellipsoid, 3.3–4 mm long, 2.4–3.3 mm broad, ca. 2.4 mm thick; *aril* thickly bilobed, ca. 1.5 mm long. (Fig. 63).

**Flowering period:**—August to October. *Fruiting period:* September to December.

**Distribution:**—Endemic in South Australia, occurring on Kangaroo Island and Fleurieu Peninsula (subsp. *asperula* only), and on Eyre Peninsula south of 34°S (both subspecies).

**Habitat:**—Grows in poor, sandy or lateritic soils in mallee or open forest dominated by *Eucalyptus* spp.

**Affinity:**—*Daviesia asperula* is morphologically very similar to *D. genistifolia*, albeit not very closely related phylogenetically (Fig. 1B). The resemblance is closest between *D. asperula* subsp. *asperula* and plants of *D. genistifolia* with vertically compressed phyllodes. Moreover, both species have minute dark red stipules (evident in *D. genistifolia* from the Flinders Ranges and variably present elsewhere). *Daviesia genistifolia* is easily distinguished by its smooth branchlets and phyllodes. In addition, the pod of *D. genistifolia* is smaller (8–11 × 4–8 mm) with a more sharply curved lower suture, the seed is more oblong and compressed, and the aril is 1-lobed and does not project beyond the profile of the seed.

Plants of *D. asperula* with flattened phyllodes have been referred to *D. incrassata* and *D. polyphylla*. Large, inflated pods distinguish both the latter species from *D. asperula*.

### 63a. *Daviesia asperula* Crisp subsp. *asperula*

References: Crisp (1982b: 55), Crisp (1995: 1174), Craigie (2015: 28).

*Phyllodes* subulate, compressed or subterete, recurved only near base, tapering from base to apex, 1–1.5 mm broad. (Fig. 63A–C).

**Distribution:**—South Australia, mainly on Kangaroo Island, with one or two outliers on the southern Eyre Peninsula and a single record from Waitpinga on the Fleurieu Peninsula.

**Selected specimens (33 examined):**—**SOUTH AUSTRALIA. Eyre Peninsula:** Warunda, 34°29'S, 135°41'E, *Herb. S.A. White s.n.*, 9 October 1909 (AD 97923312). **Kangaroo Island:** Near estuary of Harriet River, Vivonne Bay, 35°59'S, 137°11'E, *L.T. Choo 13*, 16 January 1970 (CANB); Ropers Flat, between Aerodrome and Big Gums, *G. Jackson 73*, 9 October 1960 (AD); Kelly Hill Caves, 35°58'S, 136°54'S, *A.G. Spooner 6068*, 7 October 1978 (AD); Dudley Peninsula, 0.5 km E of Cape Hart turn-off on Sapphoretown–Cape Willoughby road, 35°50'S, 138°01'E, *J.G. West 1263*, 22 December 1975 (CANB). **Lofty South:** Fleurieu Peninsula, Waitpinga, 35°36'S, 138°29'E, *J.G. Fraser s.n.*, 18 October 1955 (AD 97622007).

**63b. *Daviesia asperula* Crisp subsp. *obliqua*** Crisp (1982b: 58), Crisp (1995: 1175), Craigie (2015: 29). Type: South Australia, southern Eyre Peninsula, between Yalunda Flat and Tumby Bay, ca. 20 km west of Tumby Bay, 34°20'S, 136°00'E, *D.J.E. Whibley 1944*, 26 August 1967. Holotype: AD; isotypes: CANB, K, MEL, NSW

*Phyllodes* falciform (crescentic) or obliquely narrowly obovate, flattened, recurved along the entire length of the upper or both margins, contracted towards the base, 1.5–4.5 mm broad. (Fig. 63D–F).

**Distribution:**—South Australia, Eyre Peninsula, mainly south of Yeelanna, but possibly also between Cowell and Whyalla, though this population could not be relocated.

**Selected specimens (30 examined):**—**SOUTH AUSTRALIA. Eyre Peninsula:** Hundred of Wanilla, section 99, 34°32'S, 135°41'E, *C.R. Alcock C.127*, 19 December 1964 (AD); *ibid.*, section 100, 34°32'S, 135°41'E, *C.R. Alcock 915*, 16 August 1964 (AD); Fishery Bay, Hundred of Sleaford, section 11, 34°55'S, 135°41'E, *C.R. Alcock 1627*, 17 September 1967 (AD); Yeelanna, 34°09'S, 135°44'E, *Anon. ('School') s.n.*, October 1937 (AD 97736536); Port Lincoln, 34°44'S, 135°52'E, *J.H. Brown s.n.*, 1873 (MEL 80939); ca. 8 km E of Yallunda Flat, *B.*

*Copely 3140*, 16 September 1970 (AD); between Whyalla and Cowell, 33°20'S, 137°04'E, *M.E. Phillips 282*, 26 August 1964 (CBG); Port Lincoln, 34°44'S, 135°52'E, *C. Wilhelmi s.n., sine die* (MEL 80352); Warrow–Edillillie road, on North Block, Marble Range, 11 km E of Warrow, 34°24'S, 135°34'E, *P.G. Wilson 357*, 10 October 1958 (AD, K).

**Intermediates:**—Though there are intermediates (Fig. 63H–L) between the two subspecies, making their circumscription somewhat arbitrary, these are relatively few compared with the large number of typical specimens of the two subspecies (Crisp 1982b). *Exemplar specimen:* SOUTH AUSTRALIA. Eyre Peninsula: Ca. 1 km SE of Pearlah siding, 34°36'S, 135°41'E, *N.N. Donner 2094*, 26 August 1967 (AD).

**64. *Daviesia oxylobium*** Crisp (1995: 1218). Type [approximate locality data given because the species is rare]: Western Australia, Avon, near Quairading, 31°50'S, 117°20'E, *M.D. Crisp 6612*, 20 July 1980. Holotype: CBG; isotypes: K, MEL, NSW, PERTH

Bushy, erect *shrubs* to 1 m high, glabrous, smooth, glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete, densely and finely ribbed. *Phyllodes* crowded, erect, linear-clavate, terete, acuminate and pungent at the apex, articulate at the base, 20–70 mm long, 1–1.5(–2) mm diam., densely and finely ribbed. *Unit inflorescences* 1–3 per axil, racemose, 3–5-flowered; *peduncle* 1–1.5 mm long; *rachis* 1–4 mm long; *barren basal bracts* forming a tight involucre at the base of the peduncle, triangular, ca. 0.5–0.75 mm long; *subtending bracts* oblong, spreading at the tips, ca. 1 mm long. *Pedicels* clavate, 1–3 mm long. *Calyx* 2.5–3 mm long including the ca. 1.5 mm receptacle; lobes subequal, triangular, ca. 0.5 mm long. *Corolla: standard* very broadly to depressed-ovate, emarginate, 4–5.5 × 5.5–6 mm including the ca. 1 mm claw, with a deep central groove, rich yellow towards margins, deep pinkish red towards centre; *wings* broadly spatulate, slightly unequal in size, rounded and incurved at the apex, auriculate, saccate, ca. 5 × 2 mm including the ca. 1.5 mm claw, pinkish red; *keel* half transversely broadly elliptic with an acute apex, auriculate, saccate, ca. 4–4.5 × 1.75 mm including the 1.5 mm claw, deep red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with broad, flattened filaments and slender, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, tapered to an acicular beak, turgid towards the base, 14–18 × 8–10 mm, thick-walled. *Seed* plump, broadly ellipsoid, ca. 4 mm long, 3 mm broad, 2.75 mm thick, red-brown; *aril* scarcely lobed, ca. 1.75 mm long, orange. (Fig. 64).

**Flowering period:**—July and August. **Fruiting period:** September and October.

**Distribution:**—Western Australia, central wheatbelt, within an area approximately bounded by Quairading, Corrigin, Bruce Rock and Yorkrakine. There is also a single old record from farther west, near Wooroloo.

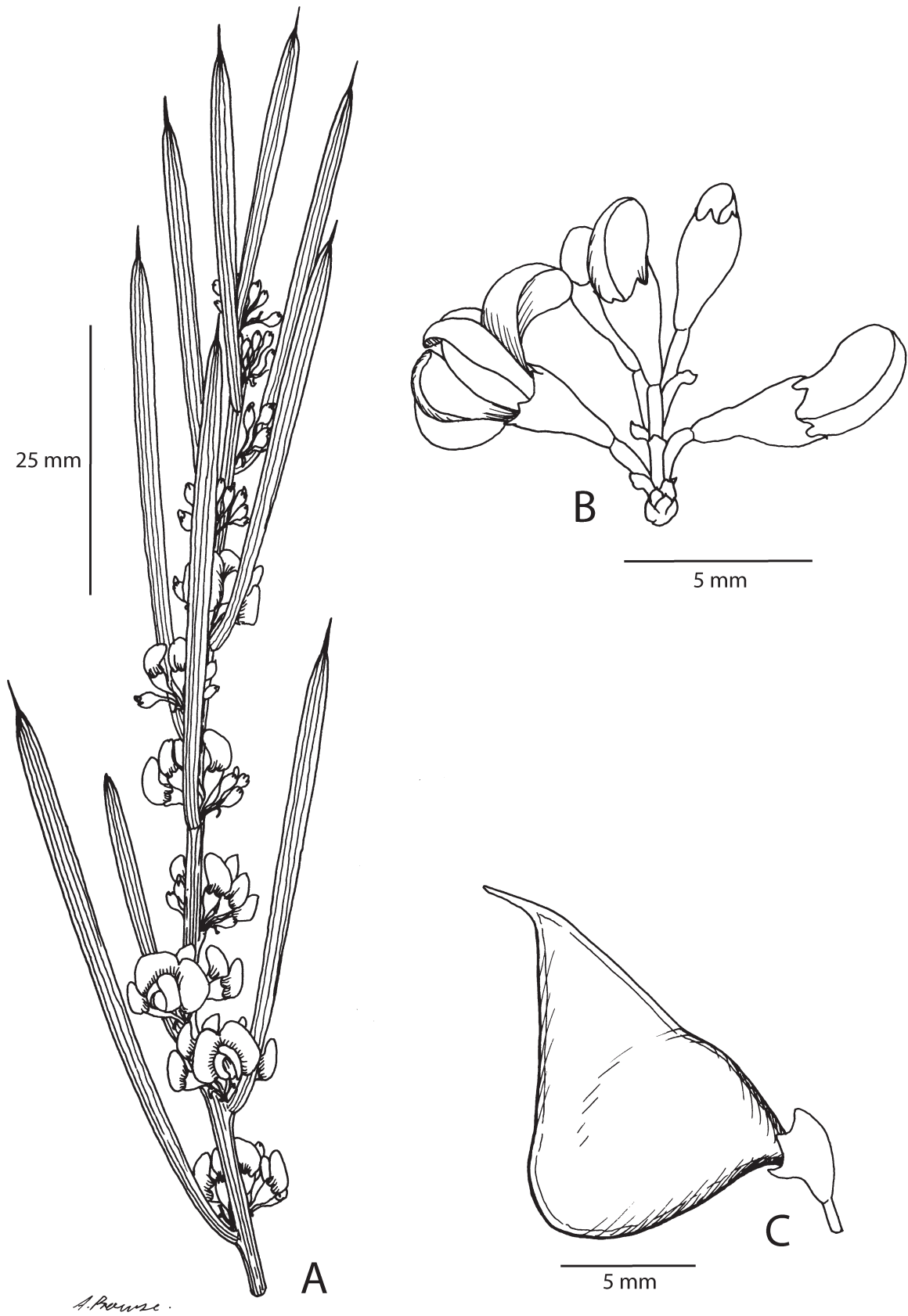
**Habitat:**—Heath with sclerophyll shrubs (kwongan), occasionally under *Eucalyptus wandoo* woodland, on sandy and lateritic soils.

**Conservation status:**—National: Not listed. WA: Priority 4, adequately known and near-threatened or not threatened, requiring regular monitoring.

**Selected specimens (12 examined):**—Approximate locality data are given because the species is rare.

**WESTERN AUSTRALIA. Avon:** Sources of the Swan River, 31°50'S, 117°20'E, *A. Eaton s.n.*, 1889 (MEL 81143); east of York, 31°50'S, 117°30'E, *A. Eaton s.n.*, 1893 (MEL 81138); near Bruce Rock, 31°60'S, 118°10'E, *R.D. Royce 7882*, 29 July 1963 (PERTH); between York and Tammin, 31°50'S, 117°20'E, *B.V. & M. Smith s.n.*, 7 October 1979 (PERTH 5146712); N of Bruce Rock, 31°50'S, 118°10'E, *C.E. & D.T. Woolcock D232*, 11 August 1982 (CBG).

**Affinity:**—Superficially, *D. oxylobium* resembles *D. teretifolia* closely, mainly in the erect, clavate, pungent phyllodes; however, the phyllode striations are more sharply defined in *D. oxylobium*. Moreover, *D. teretifolia* is not close phylogenetically (Fig. 1B) and is easily distinguished by its conspicuously longer pedicels (8–15 mm long) and larger flowers (e.g. calyx ca. 5 mm long, standard 8–10 mm broad). *Daviesia apiculata* also has terete phyllodes and could be confused with *D. oxylobium* but differs in having apiculate, semi-pungent (not acicular) phyllodes, relatively narrower wings, united upper calyx-lobes, and a compressed pod that is acute rather than beaked.



**FIGURE 64.** *Daviesia oxylobium*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6612* (type); C from *Eaton s.n.* (MEL 81143). Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Despite a relatively distant phylogenetic relationship *D. oxylobium* is similar to *D. daphnoides* in the inflorescence, floral parts, fruits and seeds. However, the flat, narrowly elliptic phyllodes of *D. daphnoides* immediately distinguish it from *D. oxylobium*. Among the differences between these species in floral morphology is the truncate upper lip of the calyx in *D. daphnoides* versus the shallow deltoid upper lobes in *D. oxylobium*.

### VII.a. *D. benthamii* Clade

**65. *Daviesia pectinata*** Lindl. in Mitchell (1838: 150), Crisp (1995: 1220), Jeanes (1996: 760), Craigie (2015: 31). Type: Interior of New Holland, *Major Mitchell's Expedition*, no. 195, 25 June 1836. Holotype: CGE; isotypes: K (3 sheets)

*Daviesia latipes* Mueller (1853: 390). Type: 'In fruticetis juxta Dombey-bay [Tumby Bay] reperit Wilhelmi.' Holotype: MEL 79652; isotypes: K, MEL 79653, P.

Dense, erect, intricate, sometimes bushy, rigid *shrubs*, 0.5–2.5 m tall, glabrous, glaucescent. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, triquetrous, vertically compressed, rigid. *Phyllodes* often crowded along the branchlet, ± divaricate, triangular or narrowly so, apically acuminate to acute, robustly pungent, vertically compressed, basally inarticulate and strongly decurrent with the stem, straight or recurved, 8–70 × 2–9 mm, striate when fresh with a more prominent nerve near upper margin, very rigid and thick. *Seedling phyllodes* ascending, triangular, straight, crowded along the branchlets, 6–13 × 2.5–6 mm. *Unit inflorescences* 1 or 2 per axil, racemose, 3–10-flowered; *peduncle* 1–1.5 mm long; *rachis* terete to tetragonal, 2–10 mm long; *subtending bracts* spatulate, ca. 1.5 mm long, spreading at the tips. *Pedicels* 0.75–1.5 mm long. *Calyx* campanulate, 3–4 mm long including the 0.5–1.5 mm stipe-like receptacle; upper 2 lobes united into a broad, truncate lip, 0.75–1.5 mm long; lower 3 lobes triangular, 0.5–1 mm long. *Corolla: standard* transversely elliptic, emarginate, 4.5–5 × 5–6 mm including the ca. 1 mm claw, grading inward from yellow at the margin through richer yellow or orange to a (dark) red infusion surrounding the bilobed, intensely yellow central mark; *wings* elliptic with a rounded apex, auriculate, ca. 5 × 1.75 mm including the 2 mm claw, orange with a reddish centre; *keel* half transversely elliptic, acute, auriculate, saccate, 4.25–5 × 1.75–2 mm including the 1.75–2.5 mm claw, orange-brown. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broad, compressed filaments with longer, slender, basifixed, 2-celled anthers; filaments free; vexillary filament flattened, tapering towards the apex and with a channel running down one side. *Pod* obliquely shallowly obtriangular, acute, compressed, often with a persistent style, 8–10 × 5–6 mm, purplish or lead-grey at first; upper suture sigmoid to strongly so; lower suture acute to 90°. *Seed* ovoid with or without a pronounced radicular lobe, compressed, 3.5–4 mm long, 2–2.7 mm broad, 1.3–1.6 mm thick, orange-brown to glossy brown with black mottling; *aril* 1–1.9 mm long. (Fig. 65).

**Common name:**—Thorny Bitter-pea.

**Flowering period:**—September and October. *Fruiting period:* October to December.

**Distribution:**—Occurs in three disjunct areas: Eyre Peninsula and Fleurieu Peninsula to Goolwa in South Australia, and the Wimmera–Little Desert in Victoria.

**Habitat:**—Grows in deep sand to sandy-loam or -clay, gravelly to clayey loam, and deep loam, on undulating to flat terrain in eucalypt open forest, woodland or mallee, with various heathland shrubs in the understorey.

**Conservation status:**—National: Not listed. SA: Rare. Vic.: Rare in Victoria but not considered otherwise threatened.

**Selected specimens (70 examined):**—Approximate locality data are given because the species is rare. **SOUTH AUSTRALIA. Eyre Peninsula:** WSW of Koppio, 34°30'S, 135°50'E, *J.D. Briggs 1263*, 27 September 1983 (AD, CBG, MEL, NSW, PERTH); ca. 20 km W of Cowell, 33°40'S, 136°40'E, *K.D. Rohrlach 949*, 16 September 1962 (AD, UC); S of Edillilie, 34°30'S, 135°40'E, *M.A. Clements 4260*, 27 September 1986 (CBG, NU); W of Cummins, 34°20'S, 135°40'E, *J.D. Briggs 1358*, 14 October 1983 (AD, CBG, MEL); Hincks National Park, 33°S, 135°E, *J.R. Wheeler 936*, 9 October 1968, seedling (AD). **Lofty South:** N of Goolwa, 35°30'S, 138°50'E, *M.D. Crisp 1891*, 31 December 1975 (AD, CBG, PERTH); Encounter Bay, 35°40'S, 138°30'E, *J.B. Cleland s.n.*, 25 January 1933 (AD 96804615). **VICTORIA. Western Highlands:** Grampians, 36°40'S, 145°50'E, *A.C. Beaglehole 30914*, 6 September 1969 (CANB, MEL, NSW). **Western Plains:** Little Desert, 36°40'S, 141°40'E, *M.G. Corrick 6784 & P.S. Short*, 3 October 1980 (CANB, MEL); near Kiata National Park, 36°30'S,

141°50'E, *T. Henshall* 322, 20 September 1969 (NSW); near Diapur, 36°20'S, 141°30'E, *A.C. Beaglehole* 84227, 12 September 1986 (AD, CANB, HO, MEL, NBG).



**FIGURE 65.** *Daviesia pectinata*. A. Flowering branchlet. B. Inflorescence with floral parts except calyces removed. C. Pod. A, B from *Henshall* 322; C from *Crisp* 1891. Drawn by B-J. Osborne.



**Affinity:**—*Daviesia pectinata* resembles *D. decurrens*, *D. dilatata* and *D. subulata*. *Daviesia decurrens* differs in having a much less prominent decurrent phyllode rib, striate bracts, and a less well-developed raceme rachis (1–2.5 mm long) compared with *D. pectinata*. Also, the calyx of *D. decurrens* is not campanulate and has 5 prominent ribs, and the upper 2 calyx-lobes are not united into a truncate lip. In the fresh state, *D. pectinata* may be distinguished from *D. dilatata* by the striations and ridges along the phyllodes and branchlets. In particular, the decurrent phyllode-bases of *D. pectinata* make the cross-section of the branchlets sharply triquetrous. When dry, *D. dilatata* is lightly striate but neither ridged or ribbed, and the cross-section of the branchlets is bluntly trigonous (immediately below the phyllodes) or terete (lower down). The phyllodes of *D. dilatata* are more frequently and more strongly decurved than in *D. pectinata*, and a well-developed raceme rachis further distinguishes *D. pectinata*. *Daviesia subulata* differs in having smaller phyllodes (4–12 mm long and 1.5–4 mm broad at the base), fewer flowers per inflorescence (2–5) and the upper 2 lobes of the calyx are not united into a truncate lip.

**66. *Daviesia eremaea*** Crisp (1980a: 271), Crisp (1981: 149), Crisp (1995: 1192). Type: Northern Territory, Central Australia South, 12 miles [19 km] NE of Narwietooma Station, 23°11'S, 132°47'E, *M. Lazarides 5991*, 15 September 1956, fl. & photo. Holotype: CANB; isotypes: AD, BRI, CANB, K, NT, PERTH, US

Multi-stemmed *shrubs*, 0.9–2 m high, glabrous. *Root anatomy* unknown. *Branchlets* erect, terete, smooth when fresh, slightly wrinkled when dry. *Phyllodes* scattered, erect, terete, apically acicular and ± pungent, thickened at the base, articulate, 40–120(–170) mm long, ca. 1(–1.5) mm diam., wrinkled when dry. *Unit inflorescences* 1 or 2 per axil, racemose, 2–5-flowered; *peduncle* 1–2 mm long; *rachis* 2–7 mm long; *subtending bracts* spreading to reflexed, spatulate, hooded, ca. 1 mm long. *Pedice* slender, 4–8 mm long. *Calyx* obliquely campanulate, 3.5–4.5 mm long including the 1.5–2 mm long receptacle to which it is abruptly contracted at the base of the tube; lobes equal, subapiculate, ca. 0.5 mm long. *Corolla: standard* transversely elliptic, retuse, slightly cordate, ca. 6 × 7 mm including the ca. 2 mm claw, yellow marginally, grading to red at the centre; *wings* obovate-oblong, auriculate, with small lobes opposite on the abaxial margin, ca. 5 mm long including the 1.5–2 mm claw, red; *keel* half transversely broadly obovate, truncate on the upper margin, obtuse, auriculate, ca. 4.5 × 2 mm including the ca. 1.5 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with shorter, compressed filaments and subglobular, subdorsifixed anthers with confluent thecae; outer whorl of 5 with longer, upwardly dilated filaments and larger, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely very broadly obtriangular, acute, compressed, 7–8 × (5.5–)6.5–7 mm; upper suture sigmoid; lower suture acute to semi-circular. *Seed* not seen. (Fig. 66).

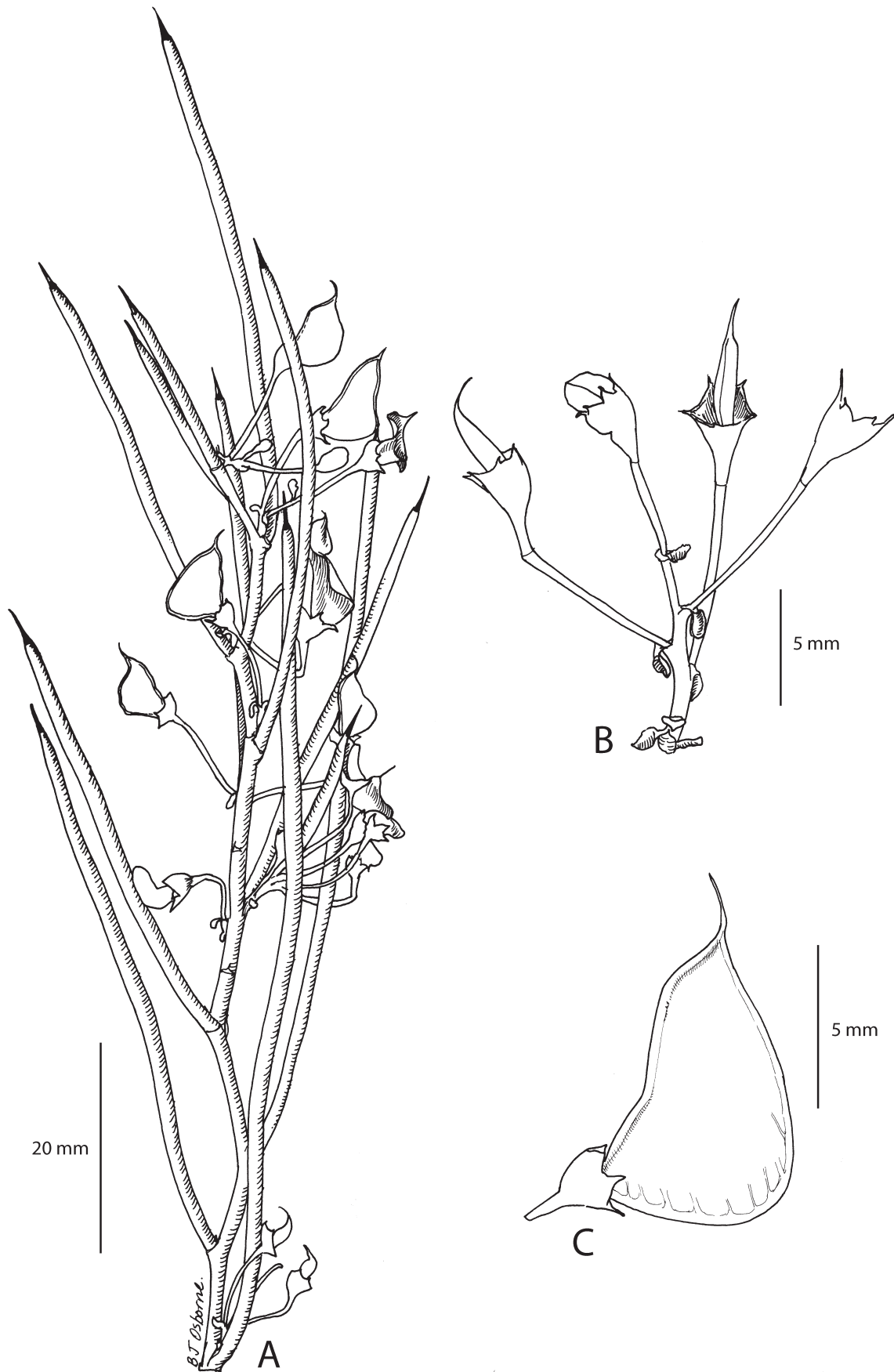
**Flowering period:**—August to October. *Fruiting period:* August to October.

**Distribution:**—Central Australia, from north-west of Alice Springs in the Northern Territory, south-west towards the South Australian Border, and in Western Australia west to the Pilbara and south-east to the Great Victoria Desert.

**Habitat:**—Grows on red sand, often at the base of dunes, in grassland with *Triodia* spp. and either *Allocasuarina decaisneana* (Mueller 1858: 61) Johnson (1982: 74) or mallee eucalypts, e.g. *Eucalyptus gamophylla* Mueller (1878: 40), or in skeletal, gravelly red soils over ironstone on mountain slopes with mallee, spinifex hummock-grassland (*Triodia*) or heath with *Acacia* or *Pimelea* Banks & Sol. ex Gaertner (1878: 186).

**Selected specimens (21 examined):**—**WESTERN AUSTRALIA. Fortescue:** Mt Tom Price, 22°46'S, 117°47'E, *K.J. Atkins HI-1163*, 29 September 1980 (formerly KARR, now in PERTH); Hamersley Range, 9.3 km W of Wildflower Mountain, 18.1 km WNW of Packsaddle Mining Camp, 16.4 km NNW of Mt Meharry, 22°50'S, 118°32'E, *S. van Leeuwen 2015*, 23 August 1995 (CANB, PERTH). **Keartland:** Little Sandy Desert, 18.2 km SSE of Lake Sunshine, 24°43'S, 120°43'E, *S. van Leeuwen 5143*, 6 September 2002 (CANB, PERTH). **NORTHERN TERRITORY. Central Australia South:** Ca. 122 km NE of Mt Davies Camp, *P.K. Latz 943*, 2 November 1970 (AD, DNA, NT); 12 km S of Mt Currie, 25°06'S, 130°33'E, *P.K. Latz 5751*, 23 September 1974 (AD, CANB, DNA, NT, PERTH); Lake Neale area, 24°28'S, 130°22'E, *J.R. Maconochie 1897*, 28 August 1973 (NT); Lake Neale–Amadeus area, 24°28'S, 130°25'E, *J.R. Maconochie 1900*, 28 August 1973 (DNA, NT); 11 km S of 'Mount Wedge' homestead, 22°57'S, 131°50'E, *D.J. Nelson 99*, 18 October 1961 (CANB, NT).

**Affinity:**—*Daviesia eremaea* is closely related to *D. genistifolia* and *D. benthamii*, both of which have phyllodes that are shorter (< 80 mm long, generally < 50 mm) and divergent at 45–90° to the branchlet. *Daviesia genistifolia* has phyllodes that articulate at the branchlet and the pedicel is < 2 mm long. *Daviesia benthamii* has phyllodes that are rigid, continuous with the branchlet, often much reduced in number and size, and the pedicel is rarely longer than 4 mm.



**FIGURE 66.** *Daviesia eremaea*. A. Branchlet with immature fruit. B. Inflorescence with immature fruit. C. Pod. A, B from *Lazarides* 5991 (type); C from *Latz* 5751. Drawn by B-J. Osborne.

**67. *Daviesia argillacea*** Crisp (1995: 1171). Type: Western Australia, Roe, ca. 55 km SSW of Norseman, 5 km from highway towards Peak Charles, 32°38'S, 121°29'E, *M.D. Crisp 5956, J. Taylor & R. Jackson*, 20 September 1979. Holotype: CBG; isotypes: K, NSW, PERTH

*Daviesia obtusifolia* Mueller (1860: 104) var. *parvifolia* E.Pritz. in Diels & E.Pritzel (1904: 247). Type: 'Hab. in distr. Coolgardie pr. Gilmores in fruticetis lutosus fruct. m. Nov. (D. 5270)' (B†). The type is missing, presumably destroyed in the Berlin herbarium during the Second World War (Hiepko 1987). However, from the description it seems probable that this taxon is conspecific with *D. argillacea*.

*Daviesia phyllodinea* Moore (1920: 168) var. *parvifolia* S. Moore (1920: 168). Type: 'Bruce Rock; Stoward, 469.' Holotype: BM.

Erect, bushy *shrubs*, to 2 m or higher, glabrous, glaucescent. *Root anatomy* with anomalous secondary thickening (cord type) or normal (unistelar). *Branchlets* ascending, terete, lightly ribbed. *Phyllodes* fairly crowded, erect, usually narrowly obovate, rarely narrowly elliptic, usually obtuse and mucronate at apex, tapered to base, articulate, 7–22(–35) × 3–6 mm; midrib visible, venation obscure. *Unit inflorescences* 1(2) per axil, flowers solitary or 2–3 in racemes; *peduncle* 0.25–2 mm long; *rachis* 0–1.5 mm long; *subtending bracts* ascending, spatulate, hooded, ca. 0.75 mm long. *Pedicels* 1–2.5 mm long. *Calyx* campanulate or tapering, 3.5–4 mm long including the ca. 1–1.25 mm receptacle, dull green with purple margins; upper 2 lobes united in a truncate, emarginate lip, ca. 0.5 mm long; lower 3 lobes triangular, ca. 0.5 mm long. *Corolla: standard* transversely elliptic, emarginate, cordate, 4.5–5 × 5–6.5 mm including the ca. 1.5 mm claw, orange to orange-yellow with a dull red or maroon centre; *wings* obliquely elliptic, rounded and incurved at apex, scarcely overlapping, auriculate, ca. 4.5 × 2 mm including the 1.5 mm claw, orange with maroon infusion towards base; *keel* half transversely elliptic, scarcely acute, auriculate, saccate, ca. 4 × 2 mm including the 1.75 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, ± acute, compressed, 5–7 × 3.5–4.5 mm, thin-walled; upper suture strongly sigmoid; lower suture acute. *Seed* not seen. (Fig. 67).

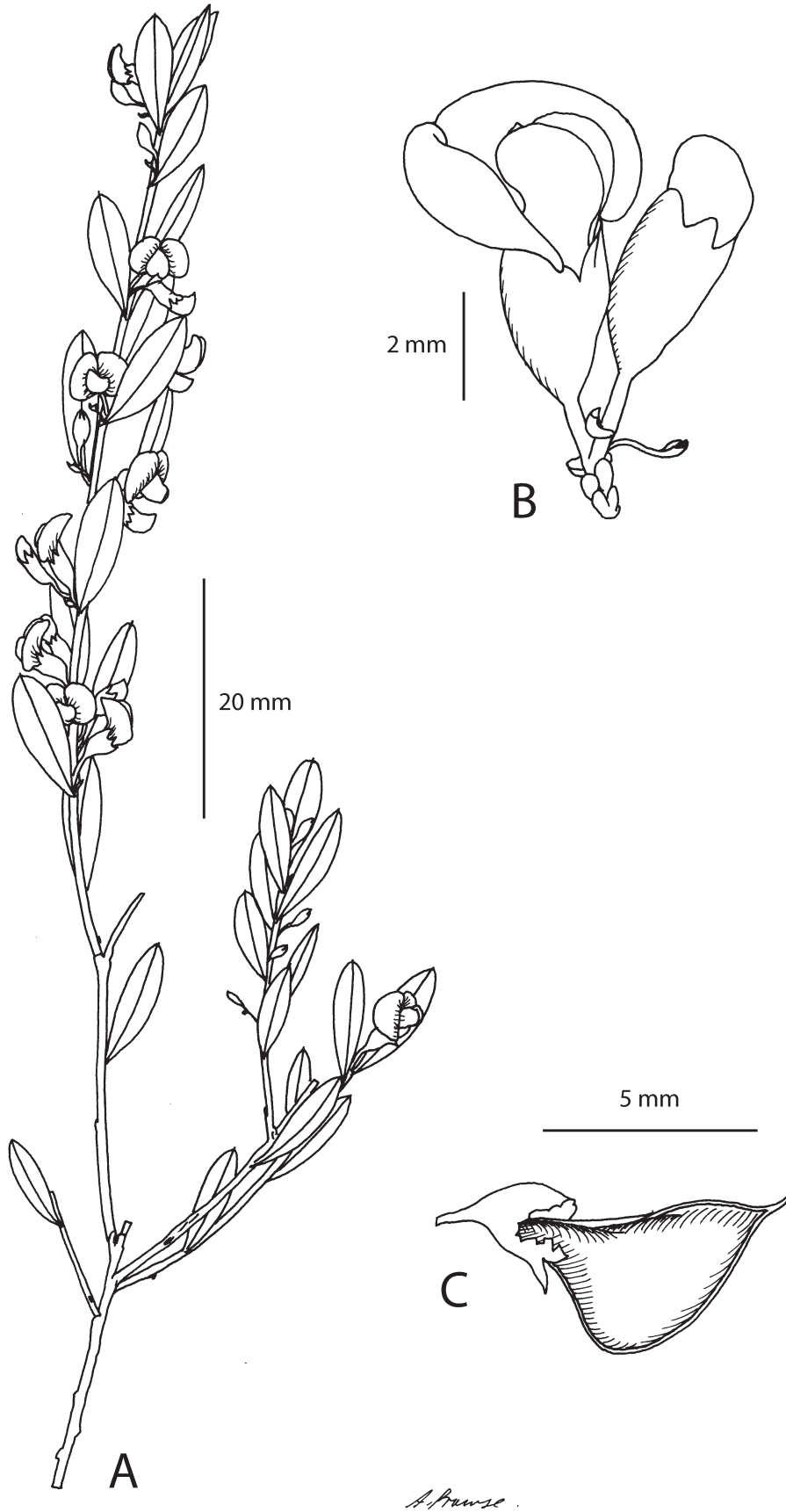
**Flowering period:**—July to October. *Fruiting period:* November.

**Distribution:**—Southern Western Australia, widespread in the region approximately delimited by Southern Cross, Narembeen, the Pallinup River, Mt Ragged and Lake Lefroy.

**Habitat:**—Grows in sand, sandy, clayey or gravelly soils over laterite or granite, mostly on flat landscapes in eucalypt woodland or mallee shrubland with understorey shrubs such as broombush (*Melaleuca* spp.) or *Dodonaea* Miller (1754: [unpaged]).

**Selected specimens (41 examined):**—WESTERN AUSTRALIA. **Avon:** Bending [41 km from Narembeen along road to Kondinin], 32°24'S, 118°18'E, *C.A. Gardner 9465*, 18 October 1949 (CANB, K, PERTH); *ibid.*, *M.D. Crisp 5518*, 27 January 1979 (CBG, MEL). **Coolgardie:** Ca. 90 km WNW of Norseman, 8 km E along road from T-junction between Bank Rock and salt lake, 31°57'S, 120°52'E, *M.D. Crisp 5934 et al.*, 19 September 1979 (CBG, MEL, NSW, PERTH); 27 km S of Yellowdine, 2 km SE of Pathfinder homestead, 31°32'S, 119°37'E, *M.D. Crisp 5578*, 30 January 1979 (CBG, MEL). **Roe:** 90 mile tank, ca. 80 km W of Daniell, 32°42'S, 120°44'E, *P.G. Wilson 3183*, 15 September 1964 (AD, CANB, NY, PERTH); 2–4 km S of Dingo Rock, 33°05'S, 122°08'E, *W. Archer 2010908*, 20 October 1990 (CANB, PERTH); Kulin Soak Nature Reserve, 32°32'S, 118°09'S, *K.J. Atkins 1368*, 23 January 1984 (CANB); 7 km NE of Clear Streak Well, ca. 65 km SE of Norseman, 32°26'S, 122°27'E, *K. Newbey 7701*, 25 September 1980 (PERTH); ca. 110 km SW of Norseman, 3 km W of Dog Rock, 32°58'S, 121°02'S, *M.D. Crisp 6019 et al.*, 21 September 1979 (CBG, PERTH); Cape Arid National Park; 3.9 km N along Balladonia Road from turnoff to Mt Ragged, 33°25'S, 123°25'E, *M.D. Crisp 11061*, 12 October 2010 (CANB, PERTH). **Eyre:** 5 km NE of Kulin, 32°40'S, 118°09'E, *K. Newbey 1525*, 21 October 1964 (PERTH); 8 km N of Chillinup Pool on Pallinup River, 34°17'S, 118°37'E, *M.D. Crisp 5143*, 14 January 1979 (CBG).

**Affinity:**—This species is readily recognised in Western Australia by its phyllodes alone: no other *Daviesia* there has phyllodes that are flat, narrowly obovate or elliptic, non-pungent, small (mostly 7–25 mm long), somewhat glaucous, with a single nerve (midrib) and unthickened margins. The phyllodes of *D. lancifolia* may appear similar but are more or less pungent and the plant is procumbent or prostrate. Phyllodes of *D. grahamii* and *D. newbeyi* may also appear similar, but have thickened margins, and additionally the calyces are 5-ribbed. The habit of *D. argillacea* is erect, and its calyx is not ribbed. *Daviesia emarginata* may also appear similar; in fact, *D. argillacea* was formerly



**FIGURE 67.** *Daviesia argillacea*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp* 5934, C from *Crisp* 5518. Drawn by A.L. Prowse. Adapted from *Crisp* (1995) with permission from CSIRO Publishing.

included under this species, as *D. obtusifolia* var. *parvifolia*. However, *D. emarginata* usually has larger, emarginate phyllodes and very different flowers, notably with a white-dotted calyx and an elongated, stipe-like receptacle that is as long as the body of the calyx. In floral and fruit characters, as well as the flat, non-pungent phyllodes, *D. argillacea* resembles *D. mimosoides* and related species in eastern Australia. However, these have either larger phyllodes (*D. mimosoides* and *D. suaveolens*), or more than two flowers per raceme (*D. buxifolia* and *D. elliptica*), or both.

**68. *Daviesia scoparia*** Crisp (1995: 1235). Type: Western Australia, Roe, 5 km N of Borden, 34°02'S, 118°16'E, *M.D. Crisp 6142*, *J. Taylor & R. Jackson*, 25 September 1979. Holotype: CBG; isotypes: K, NSW, PERTH

Leafless, 'broombush' shrubs, to 2 m high, glabrous. *Root anatomy* normal (unistelar). *Branchlets* erect, terete, subspinescent, 0.75–1.25 mm diam., smooth when fresh, striate when dry, dull green. *Phyllodes* all reduced to scales. *Unit inflorescences* 1 per axil, racemose, 1–3(4)-flowered; *peduncle* 0.5–2 mm long; *rachis* 2–8 mm long; *subtending bracts* spreading, spatulate, very cupped, ca. 1 mm long,  $\geq$  pedicels. *Pedicels* 0.5–1 mm long. *Calyx* 3–4 mm long including the ca. 1 mm receptacle; upper 2 lobes united in a truncate, emarginate lip, ca. 0.5 mm long; lower 3 lobes triangular, acute, ca. 0.5 mm long. *Corolla: standard* transversely elliptic, emarginate, ca. 6 × 7–8 mm including the 2 mm claw, yellow with a dark red-brown centre; *wings* spatulate, rounded and incurved at apex but not overlapping, slightly auriculate, ca. 5.5 × 2 mm including the 2 mm claw, maroon, fading to yellow at the tips; *keel* half transversely elliptic, scarcely acute, abaxially rugose, auriculate, saccate, 4–5 × 1.5–2.25 mm including the 1–1.75 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, obtuse, compressed, 6–7 × 4 mm, thin-walled, dark brown, upper suture markedly sigmoid; lower suture obtuse. *Seed* not seen. (Fig. 68).

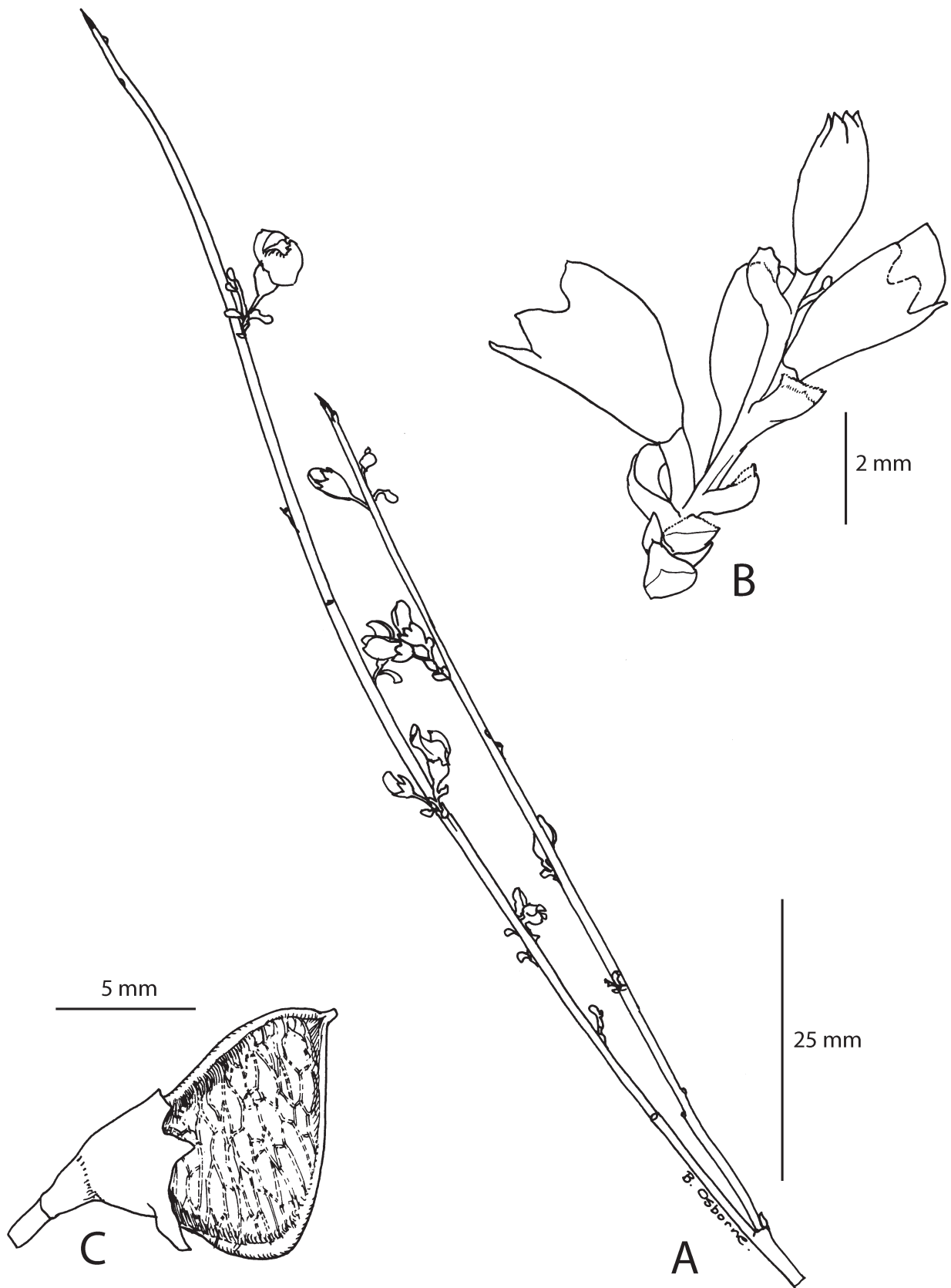
**Flowering period:**—September and October. *Fruiting period:* From September onwards.

**Distribution:**—Western Australia, widespread in the southern wheatbelt and mallee districts, from Corrigin, Katanning and the Stirling Range in the west, extending eastward to the Parmango Road area (NE of Condingup). Outlying populations occur north of the Great Eastern Highway, in the Koolyanobbing Range (e.g. *Cockerton et al. WB 34862*) and Helena and Aurora Ranges (fide M. Hislop).

**Habitat:**—Grows in gravelly, sandy or clay soils in mallee-heath or woodland dominated by *Eucalyptus* spp.

**Selected specimens (27 examined):**—**WESTERN AUSTRALIA.** **Avon:** 32 km from Katanning along road to Nyabing, 33°38'S, 117°55'E, *M.D. Crisp 5196*, 16 January 1979 (CBG). **Coolgardie:** 11 km SE of Koolyanobbing, 30°52'S, 119°36'E, *G. Cockerton & S. Regan WB 34862* (PERTH). **Roe:** E of Hyden, between Lake Cronin and Painted Cliffs, *A. Kessel 485*, 25 October 1966 (PERTH); 21 km NW of Holt Rock P.O. on track to Hyden, 32°32'S, 119°16'E, *L. Haegi 1216*, 5 October 1976 (AD, CANB, PERTH); 23 km NNW of Mt Buraminy, 33°02'S, 123°05'E, *W.R. Archer 2311913*, 23 November 1991 (CANB, MEL, PERTH); *ibid.*, *W.R. Archer 2909913*, 29 September 1991 (AD, CANB, HO, MEL, PERTH). **Eyre:** 21 km W of Ongerup, 34°01'S, 118°16'E, *K. Newbey 552*, 1 October 1962 (PERTH); 75 km NE of Ravensthorpe, 5 km S of Dunn Swamp, 33°13'S, 120°43'E, *M.D. Crisp 6048 et al.*, 21 September 1979 (AD, CBG, NSW, PERTH); ca. 80 km N of Esperance, 33°13'S, 121°43'E, *R.H. Kuchel 1717*, 12 September 1964 (AD, B, L, G, NY, MO, SI).

**Affinity:**—Of the few species in the genus with leafless, terete branchlets, *D. scoparia* is most similar to *D. aphylla* and these taxa have been confused under the latter name. Moreover, they are sympatric over a broad area of southern Western Australia. However, *D. aphylla* is seldom completely leafless—usually it has a few widely spreading, terete, robust, pungent phyllodes near the branchlet apex. When leafless, *D. aphylla* may be distinguished by its divaricate, open habit, more robust branchlets (1.5–2.5 mm diam.) which are wrinkled rather than striate in the dry state, racemes usually with four or more flowers and smaller bracts (ca. 0.5 mm long,  $\leq$  pedicels).



**FIGURE 68.** *Daviesia scoparia*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *Kuchel 1717*; B from *Crisp 6142* (type); C from *Crisp 5196*. Drawn by B.J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**69. *Daviesia nematophylla*** F. Muell. ex Benth (1864: 78), Crisp (1995: 1213). Type: 'W. Australia, Drummond, 4th Coll. n. 27; Phillips Ranges, Maxwell.' Lectotype (Crisp 1995: 1213): Swan River to King George Sound, *Drummond coll. 4 no. 27*, 1848 (K, ex Herb. Benth); isolectotype: BM, G (2 sheets), K (2 sheets: ex LINN & Herb. Hooker), MEL 79054, OXF, P (2 sheets), W. Syntype: Phillips Ranges, on a scrubby hill near Mt. Desmond, *G. Maxwell 182*, 1861 (MEL 79053); isosyntype: BM

Dense, spreading to ascending *shrubs*, 0.4–2 m high, glabrous. *Root anatomy* normal (unistelar). *Branchlets* ascending, terete, slightly striate when dry. *Phyllodes* erect, nearly always terete though occasionally compressed and spatulate, straight or gently sinuous, with a slightly recurved, mucronate tip, basally articulate, 12–80 mm long, ca. 1 mm diam. or ca. 1.5 mm broad when not terete. *Unit inflorescences* 1 per axil, flowers solitary or 2–3 in racemes; *peduncle* 0.25–0.5 mm long; *rachis* 0–2 mm long, ending in a sterile bristle up to ca. 1 mm long; *subtending bracts* spreading, spatulate, hooded, slightly striate, ca. 1 mm long. *Pedicels* 0.75–1.5 mm long. *Calyx* 3–4 mm long including the 0.75–1.5 mm receptacle to which it is tapered; upper 2 lobes united in a truncate, emarginate lip, ca. 1 mm long; lower 3 lobes triangular, recurved at tips, ca. 0.75–1 mm long. *Corolla: standard* transversely elliptic, emarginate, ca. 4.5–5 × 6.5 mm including the 1–1.5 mm claw, yellow with a dark red infusion (fading dark grey) around veins towards the centre surrounding a yellow bilobed central mark; *wings* obovate, rounded and incurved at the apex but not enclosing the keel, auriculate, ca. 5 × 2.5 mm including the 1.5 mm claw, orange grading to dark red toward base; *keel* half transversely elliptic, scarcely acute, auriculate, saccate, ca. 4.5–5 × 1.5–2 mm including the 1.5 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, somewhat compressed, 5.5–7 × 3.5–5 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 69).

**Flowering period:**—September to November. *Fruiting period:* September to December.

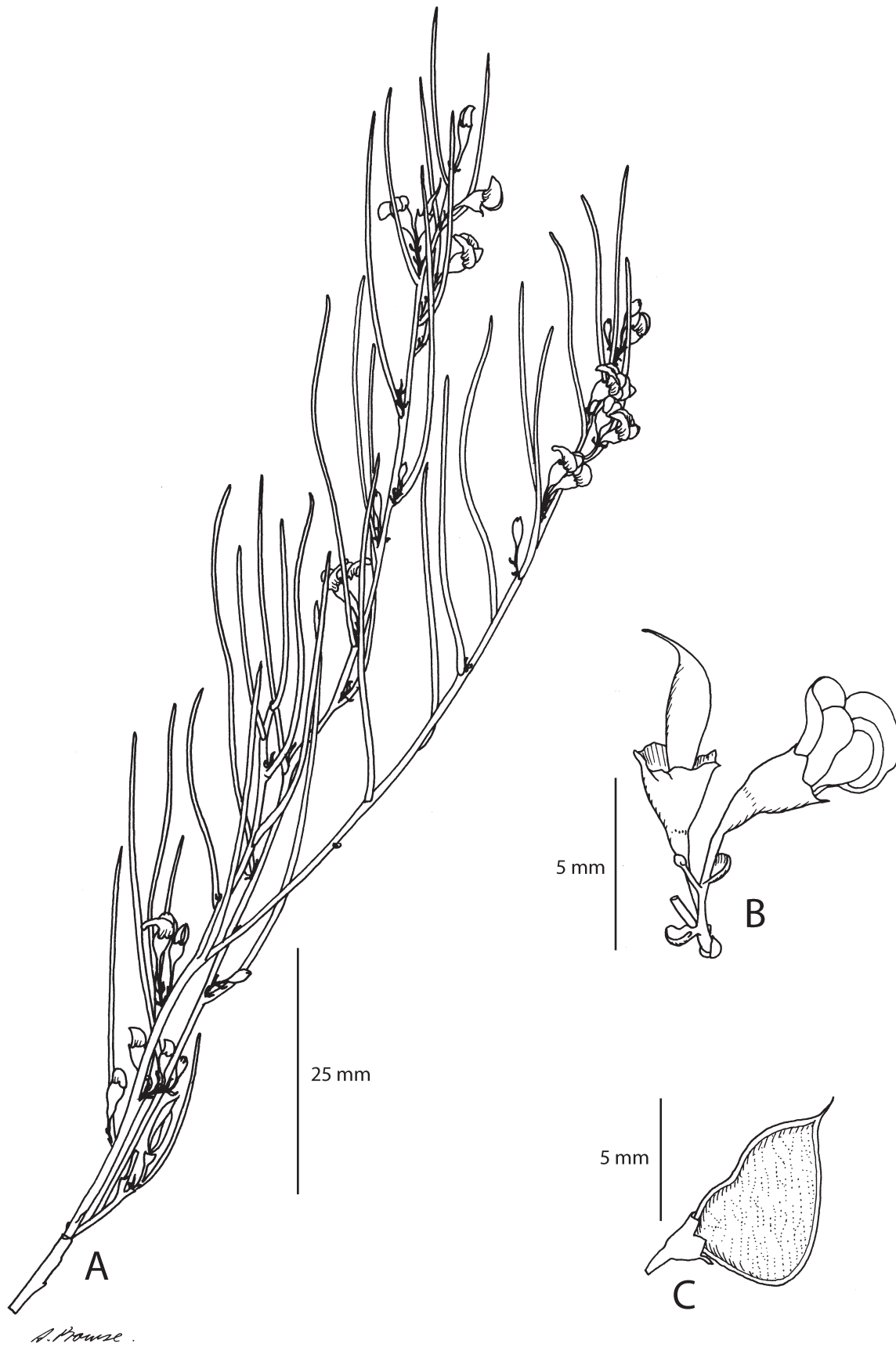
**Distribution:**—Western Australia, widespread in the wheatbelt and mallee districts from Coorow south to Hopetoun and east as far as a line from Coolgardie to east of Esperance.

**Habitat:**—Well-drained calcareous or sandy loam, or gravelly sandy soils in *Eucalyptus*-dominated woodland or heathland.

**Selected specimens (59 examined):**—WESTERN AUSTRALIA. **Irwin:** 16 km E of Coorow, opposite Paton's Dam, 29°50'S, 116°10'E, *C. Chapman (86)77*, 25 September 1977 (CBG, PERTH); *ibid.*, *C. Chapman (38A)77*, 7 August 1977 (CBG, K); 1.8 km NE of Wubin on Paynes Find road, 30°05'S, 116°38'E, *R. Coveny 7869 & B. R. Maslin*, 28 August 1976 (CANB, NSW). **Avon:** Merredin, 31°29'S, 118°17'E, *M. Koch 2709*, 10 September 1923 (MEL); 34.4 km ENE of Merredin by road, 31°22'S, 118°35'E, *R. Coveny 8345 & B. Habersely*, 11 September 1976 (CANB, NSW); 15 km NE of Kellerberrin, 31°33'S, 117°51'E, *M.D. Crisp 6585*, 20 July 1980 (AD, CBG, MEL, NSW, PERTH, US); Kununoppin, 31°07'S, 117°55'E, *F.E. Victor 13*, 30 December 1916 (PERTH). **Coolgardie:** Kangaroo Hills Reserve [ca. 10 km SW of Coolgardie], 31°00'S, 121°06'E, *P.G. Ladd 169*, 16 October 1990 (PERTH). **Roe:** 49 km WNW of Kumarl, on Kumarl–Lake King road, 32°43'S, 121°02'E, *T.B. Muir 4351*, 10 October 1966 (MEL); 4 km S of Clear Streak Well, ca. 75 km SE of Norseman, 32°31'S, 122°24'E, *K. Newbey 7696*, 25 September 1980 (PERTH). **Eyre:** 22 km E of Ravensthorpe on Esperance road, 33°44'S, 120°18'E, *C.E. & D.T. Woolcock D230*, 19 September 1982 (CBG); 25 km E of Ravensthorpe, 33°36'S, 120°19'E, *R.J. Cranfield 1014*, 5 November 1978 (PERTH); Ravensthorpe Range, 11 km SW of Ravensthorpe, 33°38'S, 120°09'E, *K. Newbey 566*, 21 October 1962 (PERTH).

**Affinity:**—Though similar to *D. aphylla*, *D. benthamii* and *D. scoparia* in its floral and fruiting morphology, and being closely related to the latter two in DNA sequences (clade VII.a, Fig. 1B), *D. nematophylla* is readily distinguished from all these and other *Daviesia* species by its erect, gently sinuous phyllodes that are slender, terete and articulate at the base.

**Hybrids:**—*Daviesia aphylla* × *nematophylla*, *D. benthamii* × *nematophylla*. Plants with short leaves (thus resembling *D. aphylla*) that are angled upwards (thus resembling *D. benthamii*) from near the south coast, e.g. around Ravensthorpe, Hopetoun and along the South Coast Hwy, are most likely hybrids between *D. aphylla* and *D. nematophylla*. A population in Ravensthorpe Caravan Park includes plants resembling both of the latter species and segregating intermediates (*Crisp 991–997*, 8984 and 9334). One individual (*Crisp 8984*) resembles *D. nematophylla* morphologically, and both its ITS sequence and its cpDNA sequences cluster with *D. nematophylla*



**FIGURE 69.** *Daviesia nematophylla*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from Chapman (38A)77; C from Chapman (86)77. Drawn by A.L. Prowse.



in the *D. benthamii* clade, but its ITS sequence is polymorphic, suggesting a hybrid origin. Hybrids between *D. benthamii* and *D. nematophylla* occur 6.5 km east of Merredin along the road to Nungarin (*Crisp* 9388–9). The individual 9388 resembles *D. benthamii* morphologically but has polymorphic ITS sequences. The individual 9389 is morphologically intermediate, as is 9391, which has rather short, robust phyllodes compared with typical *D. nematophylla*. Other putative hybrids between *D. aphylla* and *D. nematophylla* have been collected in Frank Hann National Park and near Norseman.

**70. *Daviesia subulata*** Crisp & G.Chandler, *sp. nov.*

Rigid shrub with phyllodes that are divaricate, decurrent, vertically compressed, subulate and pungent. In these respects it resembles *D. decipiens*, *D. dilatata*, *D. decurrens*, *D. pectinata* and *D. intricata* subsp. *xiphophylla*. It can be distinguished from all these species by the combination of: phyllodes straight (not recurved), diverging from the branchlet at 90° and not exceeding 12 mm in length; the sharply trigonous cross-section of the branchlets; the upper 2 calyx lobes not forming a truncate lip; pod compressed, not turgid.

Type: Western Australia, Irwin, ca. 38 km NNW of Morawa, 28°53'S, 115°51'E, *T.R. Lally 1091 & B.J. Lepschi*, 27 July 1996. Holotype: CANB; isotypes: AD, BRI, K, L, MEL, MO, NSW, PERTH, US.

Dense shrubs, 1–1.6 m high, 1.5–2 m wide, glabrous, pruinose. *Root anatomy* apparently unistelar but only a young root (< 1 cm diam.) examined. *Branchlets* ascending, trigonous in cross-section, longitudinally striate or wrinkled when dry. *Phyllodes* rather crowded, divaricate, very rigid, vertically compressed, subulate, straight, apically acuminate and pungent, basally inarticulate and decurrent, 4–12 long, 1.5–4 mm broad, longitudinally striate with multiple nerves when dry and with a more prominent nerve near upper margin. *Unit inflorescences* 1 or 2 per axil, condensed-racemose, 2–5-flowered; *peduncle* 0.5–2 mm long; *rachis* 1–2.5 mm long; *barren basal bracts* oblong, keeled, < 0.5 mm long; *subtending bracts* spreading, spatulate, hooded, keeled, fimbriate at apex, 0.5–1 mm long. *Pedicels* 1–1.5 mm long. *Calyx* 3–3.5 mm long including the 1–1.25 mm receptacle; upper 2 lobes united higher than the lower 3, broadly triangular, ca. 0.5–0.75 mm long; lower 3 lobes recurved, triangular, acuminate, ca. 0.5–0.75 mm long. *Corolla: standard* transversely elliptic, emarginate, base tapering into claw, ca. 5 × 6–6.5 mm including the 1–1.25 mm claw, standard yellow grading to red towards the centre; *wings* oblong to elliptic with a rounded and incurved apex, enclosing the keel, slightly auriculate, ca. 5–5.5 × 2 mm including the 1.5 mm claw; *keel* half transversely elliptic, scarcely acute, slightly auriculate, saccate, 4.5–5 × 1.75–2 mm including the ca. 1.5 mm claw, red, slightly paler towards apex. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with broader, shorter, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, compressed, ca. 5 × 7 mm, purplish or lead grey at first; upper suture sigmoid; lower suture scarcely acute. *Immature seed* ellipsoid to obovoid with a prominent radicular lobe, longitudinally compressed, 2.5–3 mm long, ca. 2 mm long, brown with black speckling; *aril* rugose, very small (ca. 0.5 mm), often detaching with the funicle. (Fig. 70).

**Etymology:**—*Daviesia subulata* is named after the shape of its phyllodes, which are subulate.

**Flowering period:**—July. *Fruiting period:* One specimen seen in early fruit, in October.

**Distribution:**—Restricted to several sites near Morawa, Western Australia.

**Habitat:**—Grows in gravelly, red-brown clay-loam on mostly disturbed sites including roadsides and an old quarry, in open scrub with *Allocasuarina*, *Acacia*, *Hakea* and scattered mallee eucalypts.

**Conservation status:**—Although this species is restricted to six known sites within a small area, only one of which is in a reserve, it is not currently considered threatened.

**Additional specimens examined:**—WESTERN AUSTRALIA. **Irwin:** 42 km N of Morawa towards Mullewa, track going E to roadside quarry, 28°54'S, 115°49'E, *G.T. Chandler 648 & S. Donaldson*, 24 October 1998 (CANB, PERTH); 39.8 km from Morawa, N along rd to Mullewa, old gravel pit on E side of road in nature reserve, 28°54'S, 115°50'E, *M.D. Crisp 9381 & L.G. Cook*, 16 October 2001 (CBG); 1.8 km NE of Canna Siding on Canna North East Road, ca. 38 km NNW of Morawa, 28°53'S, 115°51'E, *T.R. Lally 1092 & B.J. Lepschi*, 27 July 1996 (AD, BRI, CANB, PERTH); as previous but 2.4 km NE of Canna Siding, 28°53'S, 115°51'E, *T.R. Lally 1033 & B.J. Lepschi*, 29 June 1996 (CANB, MEL); near Site 8, Reserve 16491, located on Canna North East road, 28°53'S, 115°51'E, *Morawa Tree Society 2038*, 3 September 1994 (PERTH).



FIGURE 70. *Daviesia subulata*. Holotype. Photograph provided by the Curator of CANB.

**Affinity:**—*Daviesia subulata* is most similar to *D. dilatata* and also resembles *D. decurrens*, *D. pectinata* and *D. intricata* subsp. *xiphophylla*. *Daviesia dilatata* differs in having generally recurved-falcate, dilated phyllodes

that are larger (7–50 mm long and 2–8 mm broad) than in *D. subulata*. Also, the upper 2 calyx lobes are united in a truncate lip and the lower 3 lobes are not recurved. The pod of *D. dilatata* is longer (7–8 mm) than that of *D. subulata*, but narrower (4–4.5 mm broad), and the lower suture is obtuse, giving the pod quite a different appearance.

*Daviesia decurrens* differs from *D. subulata* in having phyllodes that are falcate or recurved, at least at the tips. The subtending bracts of *D. decurrens* are much larger (to 2.5 mm long). The calyx lobes of *D. decurrens* are not flared outward, and *D. decurrens* has 5 prominent ribs. *Daviesia decurrens* has 2 prominent calli at the base of the standard-lamina and the stamens are weakly dimorphic, with the all anthers basifixed and 2-celled.

*Daviesia pectinata* is superficially similar but differs in having phyllodes that are generally much larger (8–70 × 2–9 mm). The upper 2 calyx lobes are united into a truncate lip, and there are more flowers per inflorescence (3–10) than in *D. subulata*. *Daviesia pectinata* also has a more developed raceme-rachis (2–10 mm long) than does *D. subulata*.

*D. intricata* subsp. *xiphophylla* differs in having terete branchlets just below the phyllode base, lacking the prominent decurrent rib of *D. subulata*, and the phyllodes are reduced to scales for much of the branchlet length.

**71. *Daviesia purpurascens*** Crisp (1980a: 274), Crisp (1981: 150), Crisp (1995: 1226). Type: Western Australia, 6.3 km N of Bending on Narembeen road, 32°20'S, 118°19'E, *M.I.H. Brooker 6329*, 12 August 1979, fl., spirit material. Holotype: CBG; isotypes: AD, CANB, K, NSW, PERTH

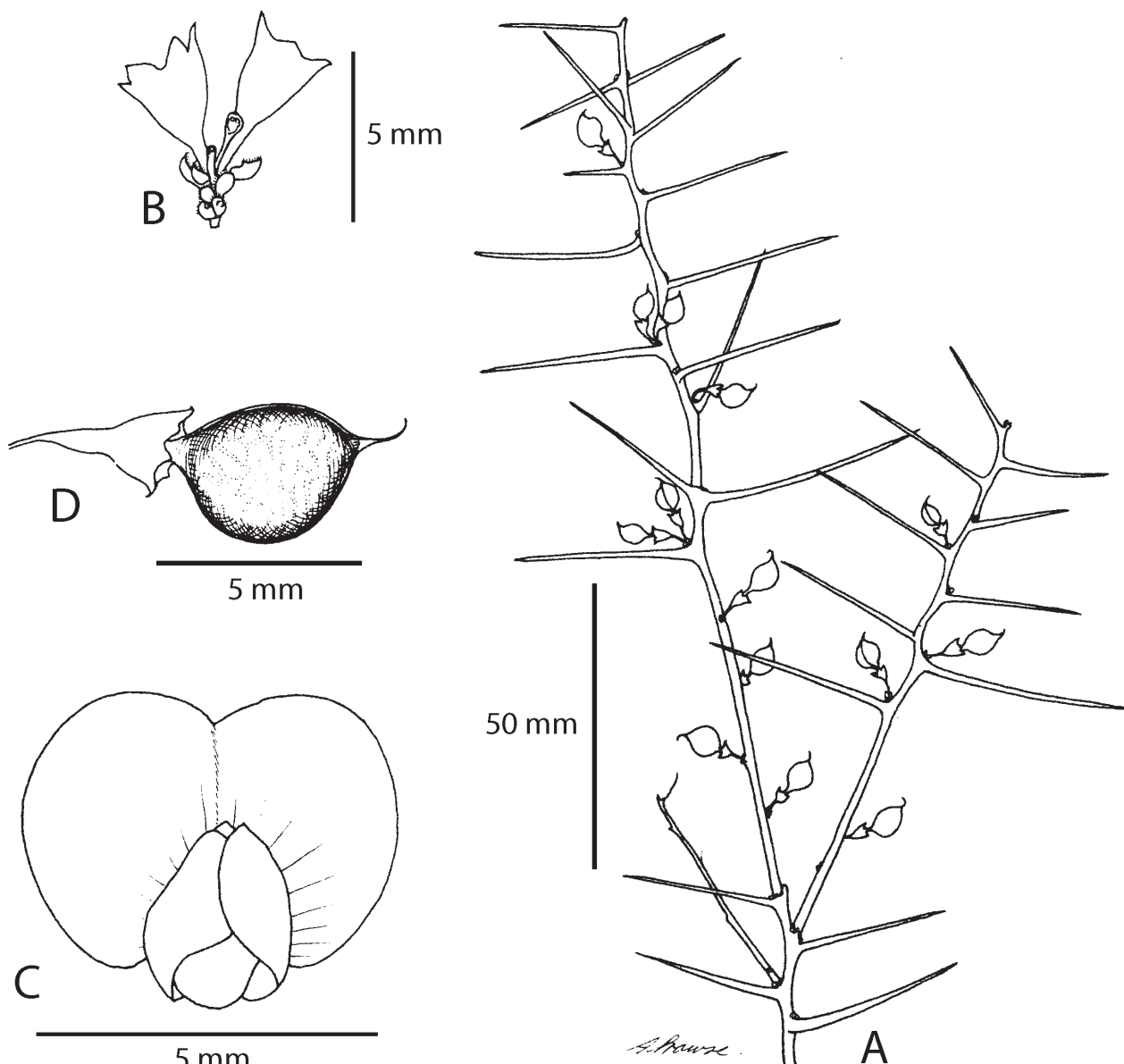
Glabrous *shrubs*, with many stems, to ca. 1 m high, glabrous, grey-green to purplish-glaucous. *Root anatomy* normal (unistelar). *Branchlets* numerous, ascending or erect, rigid, flexuose. *Phyllodes* scattered, divaricate to ascending, terete, gently tapered, pungent, inarticulate at base, 5–50 mm long, 0.7–1.5 mm diam., rigid, smooth when fresh, wrinkled-striate when dry. *Unit inflorescences* 1–3 per axil, racemose, 2–10-flowered; *peduncle* 0.25–2 mm long; *rachis* from almost nil to 14 mm long; *subtending bracts* spreading to ascending, spatulate to rhomboid, hooded, slightly fimbriate at apex, 0.75–1.5 mm long. *Pedicel* 0.5–3 mm long. *Calyx* obliquely campanulate, 2.5–3.5 mm long including the 0.75–1.25 mm receptacle; lobes subequal, very broadly to depressed-triangular, subacute to obtuse, ca. 0.5 mm long; upper 2 lobes slightly shorter, broader and are sometimes united higher than the lower 3; lower 3 lobes somewhat recurved. *Corolla: standard* depressed-ovate, retuse, subcordate, 5.5–6 × 6–7 mm including the ca. 1.5 mm claw, yellow marginally, grading to maroon at the centre; *wings* oblong to obovate, auriculate, may have lobes opposite on the abaxial margin, ca. 5–5.5 × 2 mm including the ca. 2 mm claw, maroon towards the apex; *keel* half broadly obovate with a ± obtuse apex, inflated, auriculate, saccate, 3 × 2–2.5 mm including the ca. 2 mm claw, maroon in the upper half. *Stamens* strongly dimorphic: inner whorl of 5 with longer, compressed, inflexed filaments and subglobular, basifixed anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and larger, oblong, basifixed, 2-celled anthers; filaments free. *Ovary* narrow, tapered below to a short stipe and above to the inflexed style. *Pod* obliquely broadly obovate to obtrullate in outline, acute, style persistent, turgid, 4–6 × 3–4 mm, not dehiscing elastically; upper suture sigmoid; lower suture obtuse. Immature *seed* arillate. (Figs 71, 72).

**Flowering period:**—August and September. *Fruiting period:* September and October.

**Distribution:**—Western Australia, in about five disjunct areas: near Kondinin–Narembeen area in the wheat belt; Gnarlbine Rocks south of Coolgardie; near Plumridge Lakes in the Great Victoria Desert; Bungalbin Hill in the Helena and Aurora Range; and the Ponton Creek–Queen Victoria Spring area east of Kalgoorlie. Also recorded from South Australia by a single fruiting specimen from north-western Eyre Peninsula, representing an extension of > 800 km to the known range of the species.

**Conservation status:**—Not currently of concern. However, the status of *D. purpurascens* is contingent on further genetic work that is needed to resolve its relationship to *D. benthamii* using molecular data. It might be reduced to a subspecies, or reduced to the Kondinin area population, whereas other populations (e.g. in the Gnarlbine–Coolgardie area, Helena and Aurora Range and Great Victoria Desert) could be included in *D. benthamii*. *Daviesia purpurascens* is uncommon in Kondinin area, where it is threatened by land-clearing.

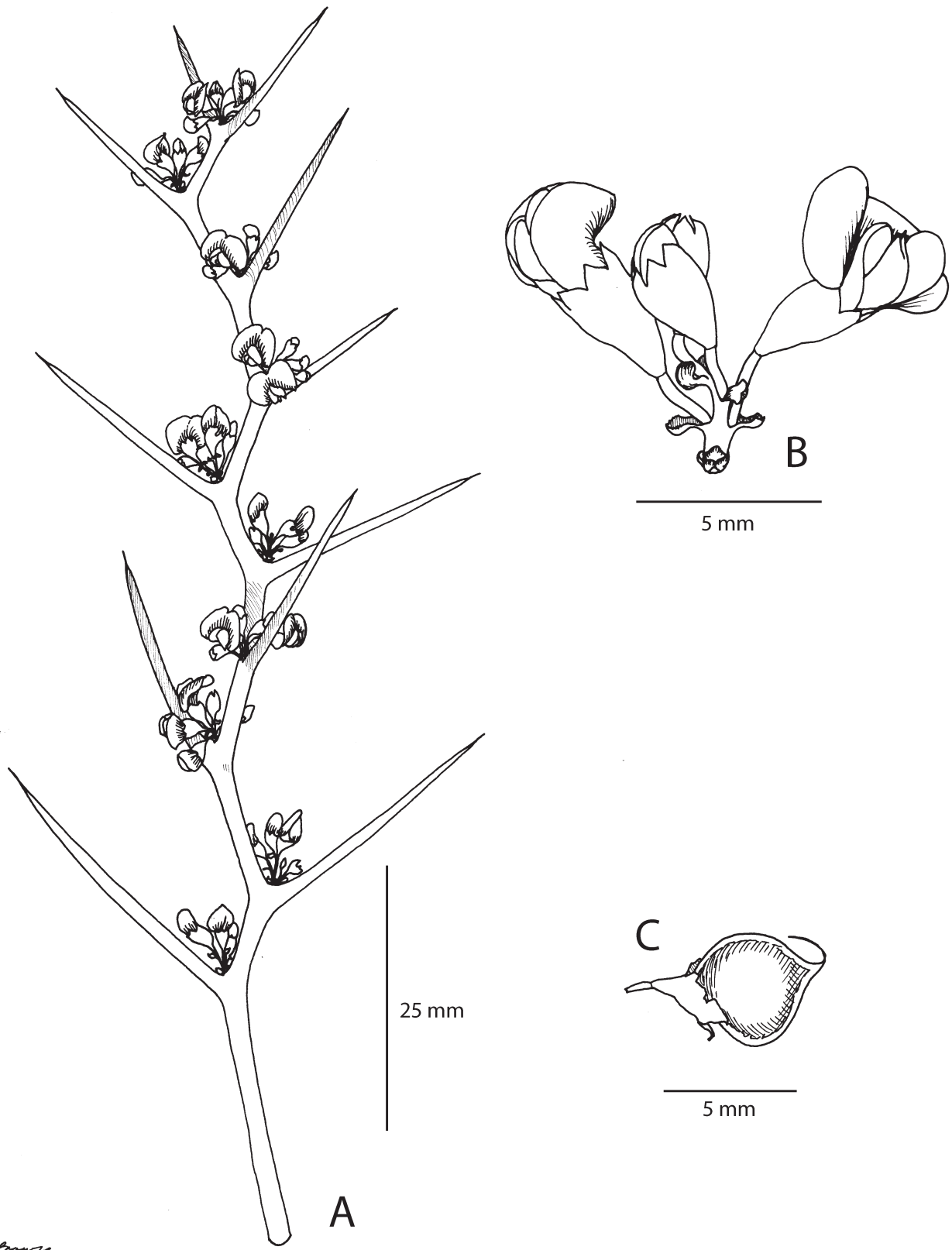
**Habitat:**—Understorey of mallee eucalypts dominated by shrubs and *Triodia*. The type population near Kondinin grows on white sand-plains. In the Great Victoria Desert and at Gnarlbine it occurs on red sand-dunes, and in the Helena and Aurora Range the substrate is red-brown clay loam over banded ironstone. The vegetation at the Great Victoria Desert site is *Triodia*-dominated with scattered mallee eucalypts and *Callitris*. At the South Australian site, it is on sandplain under mallee with *Melaleuca*.



**FIGURE 71.** *Daviesia purpurascens*, typical population. A. Fruiting branchlet. B. Inflorescence, flowers represented only by calyces. C. Flower. D. Pod. A, E from *Crisp 6168*; B, C from *Brooker 6329* (type). Drawn by A.L. Prowse. Adapted from Crisp (1980a) with permission from the Board of the Adelaide Botanic Gardens.

**Selected specimens (25 examined):**—**WESTERN AUSTRALIA.** **Avon:** Brookton–Corrigin Highway, 0.7 km N of Bullaring–Gorge Rock Road, 32°27'S, 117°59'E, *G.S. Durell 258 & L. Kerrigan*, 8 November 2000 (CANB, MEL, PERTH). **Coolgardie:** East side of track, south of creek and main track crossing, c. 8 km NE of Bungalbin Hill, Aurora Range, 30°21'S, 119°42'E, *N. Gibson 3352 & M Lyons*, 24 July 1995 (CANB, PERTH); ca. 6.5 km NE of Bungalbin Hill, Helena and Aurora Range, ca. 50 km NNE of Koolyanobbing, 30°21'S, 119°41'E, *B.J. Lepschi 1994*, 25 September 1995 (CANB, PERTH, US); 13.7 km from Bullabulling along Great Eastern Highway towards Yellowdine, 31°06'S, 120°46', *M.D. Crisp 10743*, 11 September 2010 (CANB); near Gnarlbine, 31°09'S, 120°57'E, *R. Helms s.n.*, 12 November 1891 (AD 97552085). **Helms:** Ponton Camp to Ponton Swamp and Creek, Queen Victoria Spring Nature Reserve, 30°16'S, 123°19'E, *D.J. Edinger 1079*, 20 October 1995 (PERTH). **Roë:** 40.75 km from Hyden along road to Kondinin, 32°31'S, 118°29'E, *L. Sylvester s.n.*, August 1986 (CANB 8700104); 33 km from Narembreen along road to Kondinin, 32°20'S, 118°18'E, *M.D. Crisp 5517*, 27 January 1979 (CBG, PERTH); 18 km ENE of Kondinin, 32°27'S, 118°28'E, *M.D. Crisp 6168*, *J.M. Taylor & R. Jackson*, 26 September 1979 (CBG, NSW, PERTH); 41 km from Hyden to Kondinin, 32°21'S, 118°35'E, *C.E.*

Woolcock D266 & D.T. Woolcock, 11 August 1982 (CANB). SOUTH AUSTRALIA. Eyre Peninsula: Yumberra [Conservation Park], 3 km SW of Inila Rock Waters, 31°48'S, 133°24'E, C. O'Malley & A.C. Robison NPWS 335, 11 October 1987 (AD).



**FIGURE 72.** *Daviesia purpurascens*, Gnarlbine population. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from Crisp 5902; C from Helms s.n. (AD 97552085). Drawn by A.L. Prowse.

**Affinity:**—*Daviesia purpurascens* differs from all other species of *Daviesia* by its non-triangular, turgid pods that do not dehisce elastically. *Daviesia aphylla* and *D. benthamii* can be similar to this species in vegetative morphology, but differ by their laterally compressed obtriangular pods that dehisce elastically, and also by their greenish-yellow, non-glaucous branchlets and phyllodes. Molecular data indicate that *D. aphylla* belongs in a separate clade (VII.b, Fig. 1B) and is more closely related to other species than to *D. purpurascens*. *Daviesia aphylla* also differs morphologically, having triangular pods and short phyllodes (< 20 mm long) that are confined to the branchlet apex. However, the distinction between *D. benthamii* and some *D. purpurascens* populations is problematic. Plants at or near the type locality of *D. purpurascens* (in the region of Brookton, Narembeen and Dragon Rocks, WA) have relatively crowded phyllodes spreading more or less at right angles from the stem, are strongly purplish-glaucous and have the typical small, oblong pods (Fig. 71) (e.g. *Brooker 6329*, *Crisp 6168* and *Durell 258*). Other populations have sparser phyllodes that can be angled upwards (Fig. 72) (e.g. *Crisp 10743* from near Bullabulling, *Lepschi 1994* and *Gibson 3352* from the Helena and Aurora Range, and *O'Malley & Robinson NPWS 335* from Eyre Peninsula, SA) or pods with intermediate morphology or colour (e.g. *Forbes 1772* from near Carnamah, and *Gibson 4399* from Marchagee, which are here included in *D. benthamii*). DNA sequences of *D. purpurascens* from near the type locality (e.g. *Crisp 6168*) do not cluster with those from Gnarlbine Rock, near Coolgardie (Fig. 1B), but some of the latter could be hybrids with *D. aphylla* (see below). The relationship of *D. aphylla*, *D. benthamii* and *D. purpurascens* will be investigated using larger samples and in the meantime we continue to treat them as distinct species.

**Hybrids.** *Daviesia aphylla* × *purpurascens*. The population around a sand mine at Gnarlbine Rock, ca. 30 km SSW of Coolgardie, WA, includes plants resembling *D. purpurascens* (*Crisp 5607–9*, *5902–3*, and *9396–7*) but with vegetative parts varying from green to bluish grey, as well as plants resembling *D. aphylla*. The DNA sample from *D. aphylla* (*Crisp 9398*) yielded polymorphic ITS sequences, which when cloned, yielded a haplotype from each parental species and a third that is a likely recombinant.

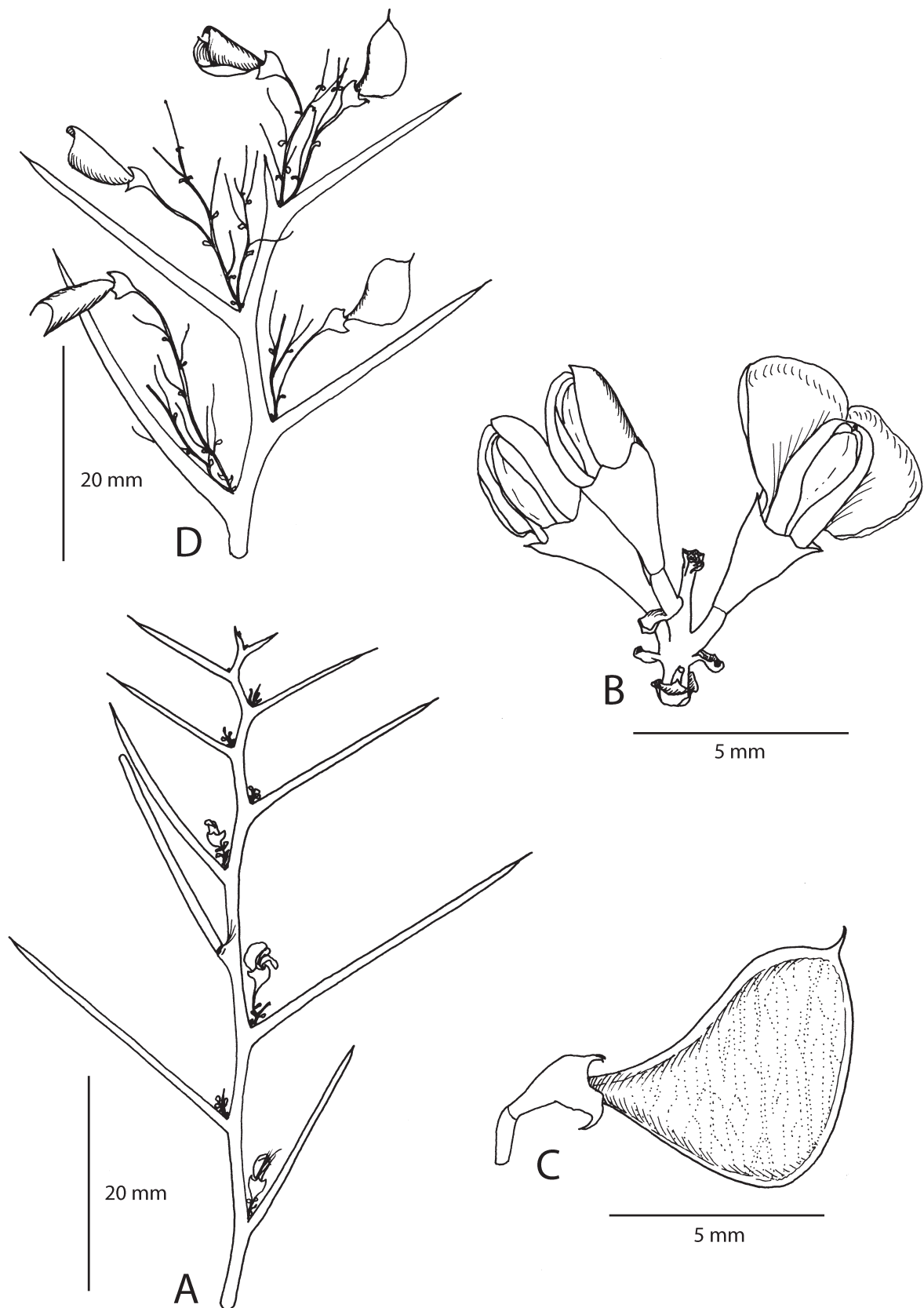
**72. *Daviesia benthamii*** Meisner (1844: 48), Crisp (1980a: 271, partly), Crisp (1995: 1175, partly). *Daviesia incrassata* Sm. var. *benthamii* (Meisn.) Domin (1923: 34). Type: 'Swan River Drummond no. 241'. Holotype: BM; isotypes: E, G (2 sheets), MEL, OXF, P (2 sheets), W (2 sheets)

Bushy shrubs, 0.5–1(–2) m high, glabrous, dull green. *Root anatomy* anomalous (cord type). *Branchlets* from rather slender to thick and rigid, ± smooth when fresh, ribbed when dry. *Phyllodes* scattered, diverging at 45–60° (to 90° in specimens from the Shark Bay area), terete, pungent, inarticulate at the base, 10–80 (100) mm long and increasing in length down the branchlet but abruptly absent in about the lower third of the branchlets, 0.8–1.8 mm diam., obscurely ribbed when dry. *Unit inflorescences* 1 per axil, racemose, 4- or more-flowered; *peduncle* 0.5–4 mm long; *rachis* 1.5–12 mm long; *subtending bracts* spreading, oblong, apex acuminate, 0.5–1 mm long. *Pedicels* 1–7 mm long. *Calyx* 2.5–3.5 mm long including the 1–1.5 mm receptacle; lobes equal or upper 2 united slightly higher than the lower 3, all acuminate or upper 2 apiculate, 0.5–0.75 mm long. *Corolla: standard* transversely elliptic, retuse, 3–5 × 4–5.5 mm including the ca. 1.5 mm claw, yellow marginally with dull red infusion surrounding a central vertical, linear, dull yellow mark; *wings* obovate, rounded, incurved and partly enclosing the keel, auriculate, 4.5–5 × 1.75–2.5 mm including the ca. 1.5 mm claw, dull red grading to yellow or orange at the tips and margins; *keel* half transversely broadly elliptic, acute, auriculate, saccate, 4 × 1.5 mm including the 1.5 mm claw, dull red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* very broadly obovate to obtriangular, scarcely acute to slightly obtuse, strongly compressed, 5–7 × 4–6 mm, slightly rounded in outline, often with a pruinose bloom; upper suture slightly sigmoid; lower suture acute but broadly rounded. *Seed* not seen. (Fig. 73).

**Flowering period:**—July to September. *Fruiting period:* January and February.

**Distribution:**—Western Australia, extending from the Ningaloo Coast south to the Darling Range and east through the wheatbelt to around Merredin.

**Habitat:**—Grows in a variety of soils, from sand and gravelly clayey sand to clay and clay loam and gravelly laterite in eucalypt-dominated mallee or woodland (e.g. wandoo), shrubland with *Acacia*, *Allocasuarina* or *Eremophila* (Brown 1810: 518) and scattered eucalypts, or in *Triodia*-dominated hummock-grassland.



*A. Prowse.*

**FIGURE 73.** *Daviesia benthamii*. A. Flowering branchlet with short racemes. B. Short inflorescence. C. Pod. D. Fruiting branchlet with long racemes. A from *Drummond 241* (type); B from *Crisp 6193*; C from *Crisp 5480*; D from *George 10183*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Selected specimens (80 examined):**—**WESTERN AUSTRALIA. Carnarvon:** 106 m [iles] along Exmouth Road, 23°20'S, 113°50'E, *R. Blake S2239*, October 1972 (PERTH); E of Mystery Well, Dirk Hartog Island, 25°39'S, 113°02'E, *A.S. George 11582*, 6 September 1972 (CANB, PERTH); 14.5 km S of 'Gnaraloo' homestead, 23°56'S, 113°31'E, *A.S. George 10183*, 3 September 1970 (CANB, PERTH). **Austin:** Tallering Station, [N of ] Pindar, 28 km E of Mullewa, 28°29'S, 115°16'E, *W.E. Blackall 674*, 18 September 1931 (PERTH). **Irwin:** Northern part of Oakagee Nature Reserve, near Olsen Road, N of Geraldton, 28°34'S, 114°40'E, *L. Atkins 281*, 17 August 2008 (PERTH); 16 km S of Carnamah on Eneabba No. 1 Road, 29°48'S, 115°50'E, *S.J. Forbes 1772*, 23 October 1983 (CANB, PERTH); ca. 5 km N of Morawa, 29°10'S, 116°01'E, *H. Demarz 6890*, 23 September 1978 (CANB, PERTH); 32.5 km E of Coorow on Lathan Road, 29°45'S, 116°15'E, *C. Chapman (99)77*, 9 October 1977 (CBG); 8 km WSW of Winchester, N end of location 8194, 29°48'S, 115°52'E, *C. Chapman (120)77*, 12 November 1977 (CBG). **Avon:** Piawaning, 30°50'S, 116°23'E, *M.D. Crisp 5480*, 26 January 1979 (CBG); 17 km NW of Quairading, 5.5 km W of Tongerung Well, 31°55'S, 117°17'E, *M.D. Crisp 6193 et al.*, 27 September 1979 (CBG, MEL, PERTH); Wongan Hills town site, Christmas Rock Walk Trail, 32°53'S, 116°43'E, *M.D. Crisp 10048 & L.G. Cook*, 23 September 2005 (CANB); ca. 5 km N of Morawa, 29°10'S, 116°00'E, *H. Demarz 6890*, 23 September 1978 (CANB, PERTH); Koolanooka Hills, 18 km E of Morawa, 29°13'S, 116°13'E, *G.J. Keighery 2041 & J.J. Alford*, 15 Aug 1990 (CANB, PERTH); 14.5 km N of Dangin, 1 km S of T-junction, 31°55'S, 117°18'E, *B.H. Smith 987*, 30 September 1987 (CBG, MEL); 50 km S of Mullewa, 28°57'S, 115°26'E, *C.E. & D.T. Woolcock D220*, 22 August 1982 (CANB). **Coolgardie:** Wadderin Rock, 32°00'S, 118°26'E, *E.T. Bailey 354*, September 1947 (PERTH); ca. 20 km N of Muntadgin, 31°38'S, 118°39'E, *P. Wilson 3459*, 22 September 1964 (AD). **Darling:** Toodyay–Bindoon road, ca. 31°30'S, 116°20'E, *C.E. & D.T. Woolcock D220*, 24 August 1982 (CBG, MO).

**Affinity:**—Previously, three subspecies were included in *D. benthamii* (Crisp 1982b;1995) but new molecular data (see section on Species Delimitation above) strongly support its division into four cryptic species that are difficult but not impossible to diagnose morphologically (*D. benthamii* s.s., *D. aphylla*, *D. devito* and *D. schwarzenegger*). *Daviesia aphylla* (q.v.) was previously treated as *D. benthamii* subsp. *acanthoclona* (Crisp 1995). It is distinguished from *D. benthamii* by having phyllodes absent or few (up to 6) and developed only near the branchlet apex, diverging at ca. 90°, short (< 20 mm), and not increasing in length down the branchlet.

Some specimens from the Three Springs–Howatharra–Paynes Find area (WA) resemble *D. aphylla* morphologically by having few, short phyllodes near the branchlet apex (*Atkins 281*, *Crisp 6316*, *Woolcock D235*) or are leafless (*Demarz 6890*, *Firth 711*) but DNA sequences unambiguously place them with *D. benthamii*, not with *D. aphylla*. Specimens from near the WA south coast, in the vicinity of Jerramungup–Ravensthorpe and Fitzgerald River National Park, appear intermediate between *D. benthamii* and *D. aphylla* but most likely are a form of the latter (e.g. *Kern et al. LCH 17265*, *Davis 2226*, *Gardner s.n. PERTH 05496233* and *George 10535*). Other specimens from the south coast (e.g. Ravensthorpe and Pallinup River) previously identified as *D. benthamii* subsp. *benthamii* are hybrids between *D. aphylla* and *D. nematophylla*. See discussion under *D. nematophylla*.

The former *D. benthamii* subsp. *humilis* (Crisp 1982b) is here divided into two species, *D. devito* and *D. schwarzenegger* (q.v.). *Daviesia devito* extends through mallee districts of southern WA, SA, Vic. and into western NSW. It is a low (< 1 m), spreading shrub with divaricate phyllodes developed all along the branchlets and is reliably distinguished from *D. aphylla*, *D. benthamii* and *D. schwarzenegger* by having minute, triangular, dark red stipules. *Daviesia schwarzenegger* is largely sympatric with *D. devito*. It differs from *D. benthamii* in having very robust phyllodes that are distributed all along the branchlets and scarcely increase in length (if at all) down the branchlet, rarely exceeding 3 cm. *Daviesia benthamii* has been confused with *D. genistifolia* in the past but the latter has basally articulate phyllodes, larger flowers (e.g. standard 4.5–5.5 × 5–6.5 mm) and larger pods (8–11 × 4–8 mm).

**Hybrids:**—*Daviesia benthamii* × *nematophylla*. See discussion under *D. nematophylla*.

## VII.b. *D. aphylla* Clade

### 73. *Daviesia schwarzenegger* Crisp & L.G.Cook, sp. nov.

This taxon was previously included in *D. benthamii* subsp. *humilis*, but here we divide this subspecies into two cryptic species (*D. devito* and *D. schwarzenegger*) first recognised from molecular data. *Daviesia schwarzenegger* is distinguished from



its cryptic twin *D. devito* by lacking stipules, having wrinkled rather than ribbed branchlets and phyllodes (when dry), and its overall more robust appearance.

Type [approximate locality data given because the species is rare]: New South Wales, W of West Wyalong, 33°50'S, 147°00'E, *M.D. Crisp 11747*, 7 September 2016. Holotype: CANB 893045; isotype: NSW.  
[*D. benthamii* Meisner (1844: 48) subsp. *humilis* Crisp (1982b: 60, partly, not including the type), Crisp (1995: 1176, partly), Jeanes (1996: 761, partly), Crisp (2002: 524, partly), Craigie (2015: 29, partly).]

Dense, hummocky *shrub* to 1.3 m high and × 3 m broad, suckering from roots, glabrous, dull green to glaucescent. Root anatomy normal (unistelar). *Branchlets* rigid, ascending, terete and smooth when fresh, longitudinally wrinkled when dry. *Phyllodes* scattered, divaricate, terete to obscurely angular when dry, acicular and pungent at apex (spine 1–2 mm long), inarticulate and somewhat decurrent at the base, 10–25(–35) mm long, 1–2 mm diam. at base, not or scarcely increasing in length down the branchlet and replaced by scales only near the branchlet base, rigid and robust; stipules absent. *Inflorescences* racemose, usually condensed, 2–4-flowered; *barren basal* bracts forming an imbricate involucre; *subtending bracts* covering inflorescence rachis, but less than 1–2 mm long, keeled, minutely ciliate at the margins, mauve; rachis 1–5 mm long, angular. *Pedicels* ca. 1 mm long. *Calyx* campanulate, faintly ribbed, glabrous except at margins, often pruinose; lobes subequal with the lower 3 recurved and acuminate. *Corolla: standard* transversely elliptic, retuse, 3–4 × 4 mm including the ca. 1 mm claw, orange-yellow at margins, grading through red and maroon towards the central linear-oblong yellow stripe, fading with age to yellow and grey; *wings* obovate, rounded and incurved but not enclosing the keel, auriculate, 4.5–5 × 1.75–2.5 mm including the ca. 1.5 mm claw, dark red with orange tips; *keel* half transversely broadly elliptic, acute, auriculate, 4 × 1.5 mm including the 1.5 mm claw, very dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* broadly obtriangular, slightly obtuse, strongly compressed, 5–7 × 4–6 mm, slightly rounded in outline; upper suture slightly sigmoid; lower suture acute but broadly rounded. *Seed* reniform, brown with black mottling, with a small rugose aril. (Fig. 74A, B).

**Etymology:**—Surprisingly, DNA sequence data showed *D. benthamii* subsp. *humilis* to comprise two cryptic species that are more closely related to other species than to *D. benthamii* (see details under Affinity below). As they are unexpected and unlikely ‘twins’, we have named them after the actors who played an unlikely pair of twins in the eponymous Hollywood movie: Arnold Schwarzenegger and Danny DeVito. We have named this species after Schwarzenegger because he is much more robust than his twin: ‘The embryo did split in two, but it didn't split equally. All the purity and strength went into Julius [Schwarzenegger's character]’. This difference between the actors parallels the growth habit difference between the two *Daviesia* species. We also wish to honour Arnold Schwarzenegger's leadership (as governor of California) in pioneering the reduction of carbon emissions, and for advising the Australian government to do the same (Anonymous 2015).

**Flowering period:**—September and October. *Fruiting period:* November and December.

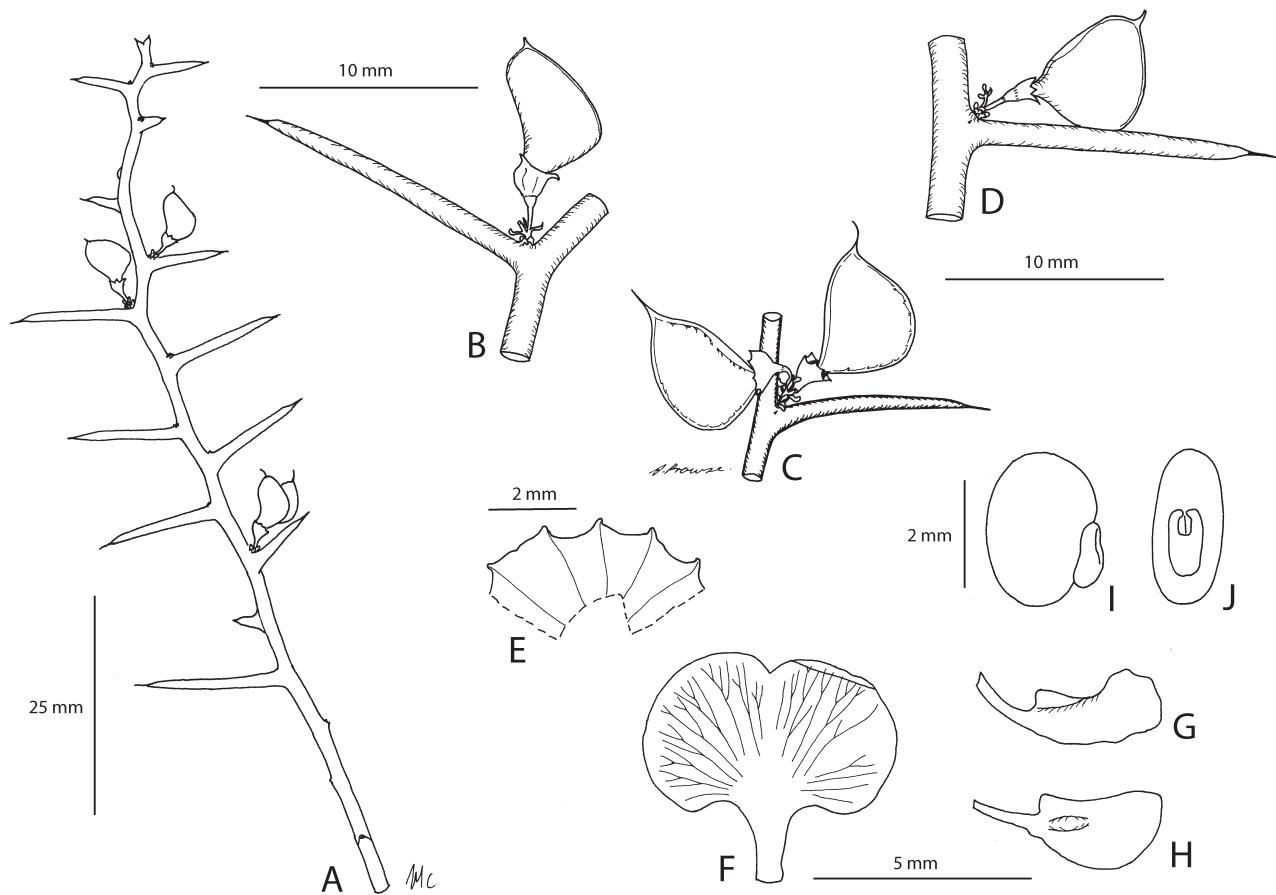
**Distribution:**—Scattered through mallee districts from Eyre Peninsula and the southern Flinders Ranges in South Australia, through northern Victoria and as far north as Condoblin in New South Wales.

**Habitat:**—This species prefers clay soils on drier sites dominated by mallee eucalypts such as *Eucalyptus odorata* Behr (1847: 657), *E. polybractea* Baker (1901: 692) and *E. viridis*. It appears to be long-lived (*Brewer 025*) and able to survive in disturbed sites such as roadsides.

**Conservation status:**—Although geographically widespread, this species is known almost entirely from roadside remnants in country cleared for growing wheat, and so is probably threatened.

**Selected specimens (17 examined):**—Approximate locality data are given because the species is rare. **SOUTH AUSTRALIA. Eyre Peninsula:** Hundred of Campoona, 33°30'S, 136°30'E, *M. Bennell & D. Canty DEP 5495*, 30 October 1986 (AD). **Lofty North:** N of Jamestown, 33°00'S, 138°40'E, *M.G. Catford s.n.*, October 1975 (AD, CBG 60426, K, MEL, W); *ibid.*, *M.D. Crisp 9425 & L.G. Cook*, 17 September 2002 (AD, CANB). **Murray Basin:** vicinity of Burra Gorge, 33°50'S, 139°00'E, *A.C. Spooner 6459*, 18 August 1979 (AD); *ibid.*, *K.H. Brewer 025*, 24 December 2005 (AD). **Kangaroo Island:** Kingscote, *J.G.O. Tepper s.n.*, 1880s (AD 97622061C, MEL 80962A). **VICTORIA. Northern Plains:** Near Wychitella, 36°20'S, 143°40'E, *A.C. Beaglehole 69324*, 21 October 1981 (CANB, MEL); near Rushworth, 36°40'S, 145°E, *G.W. Carr s.n.*, 14 October 1979 (AD, CANB 7910821, LTB, MEL); *ibid.*, *M.E. Phillips*, 29 October 1961 (CBG); W of Rushworth, 36°30'S, 145°E, *M.D. Crisp 9558 & L.G. Cook*, 19 Oct 2002 (CANB); near Tatura, 36°30'S, 145°10'E, *E. Gauba*, 2 October 1955 (CANB);

Whipstick Scrub, N of Bendigo, 36°40' 144°20'E, *M.E. Phillips s.n.*, 11 October 1966 (CBG 19043). **Western Highlands:** Grampians, 37°10'S, 142°30'E, *H.B. W[illiamson] s.n.*, December 1899 (CANB 318263). **NEW SOUTH WALES. Central West Slopes:** Near Tallimba, 34°00'S 146°50'E, *W. McRreadie*, October 1962 (CANB); W of West Wyalong, 33°50'S, 147°E, *J.W. Wrigley 71/213*, 15 December 1971 (CBG 435216).



**FIGURE 74.** *Daviesia schwarzenegger*. A. Fruiting branchlet. B. Detail of phyllode and pod (stipule absent). *Daviesia devito*. C, D. Detail of phyllodes with pods, showing minute triangular stipule just below axil. E. Calyx opened out, upper lobes at left. F. Standard. G. Wing. H. Keel. I. Seed with aril, lateral view. J. Same, hilar view. A, B from *Wrigley 71/213* (CBG 435216), C from *Phillips s.n.* (CBG 3199); D from *Tepper s.n.* (MEL 80962), E–H from *Crisp 931*, I, J from *Tepper s.n.* (AD 97622061C). Drawn by M.D. Crisp, except C by A.L. Prowse. Adapted from Crisp (1980a) with permission from the Board of the Adelaide Botanic Gardens.

**Affinity:**—This species was previously included in *D. benthamii* as subsp. *humilis*, but here we divide this subspecies into two cryptic species (*D. devito* and *D. schwarzenegger*), which DNA sequences have shown to be reciprocally monophyletic and more closely related to other species than to each other or to *D. benthamii* (Fig. 1B). *Daviesia devito* is distinguished from its cryptic twin *D. schwarzenegger* by having minute (ca. 1 mm) triangular, dark red stipules, ribbed rather than wrinkled branchlets and phyllodes (when dry), and a more slender, less robust appearance overall. *Daviesia benthamii* s.s. is restricted to the central wheatbelt of Western Australia and northwards. It has a similar vegetative appearance to *D. schwarzenegger* but the phyllodes increase in length downwards from the branchlet tip to 50 (100) mm long, with the lower third of the branchlet abruptly leafless. *Daviesia aphylla* (previously named as *D. benthamii* subsp. *acanthoclona*) overlaps in distribution with *D. schwarzenegger* in central-eastern South Australia but no closely adjacent populations are known. It differs from *D. schwarzenegger* in its tall habit (1–3 m) and non-glaucous branchlets that are almost leafless or have short (< 20 mm) phyllodes confined to the upper few nodes of the branchlets. *Daviesia genistifolia* can be confused with *D. schwarzenegger* but differs in having the phyllodes articulate at the branchlet.

**74. *Daviesia aphylla*** F.Muell. ex Bentham (1864: 88). Type: ‘Oldfield River, Maxwell.’ Holotype: K; isotypes: MEL (2 sheets), PERTH

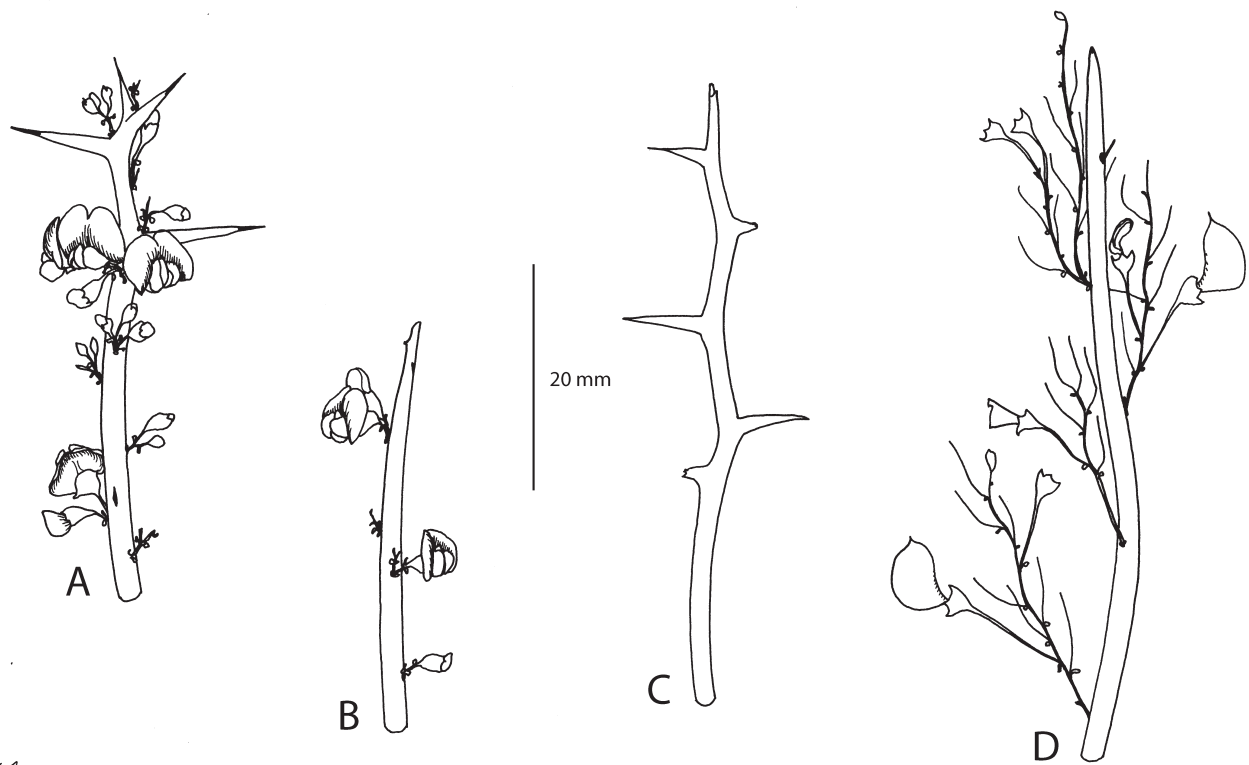
*Daviesia brevifolia* Lindl. in Mitchell (1838: 200) var. *ephedroides* Benth. (1864: 84). Type: 'W. Australia, Drummond n. 137.' Holotype: K.

*Daviesia acanthoclona* Mueller (1876: 32). *Daviesia benthamii* Meisner (1844: 48) subsp. *acanthoclona* (F.Muell.) Crisp (1995: 1175), Crisp (2002: 524), Craigie (2015: 29). Type: 'Ad fontes Victoriae; Giles et Young.' Holotype: MEL.

*Daviesia nudula* Black (1947: 20). Type: 'Berri (River Murray).' Holotype: Berri, J. Black, October 1924 (AD); isotype: K.

[*D. benthamii* auct. non Meisn.: Crisp (1982b: 60, partly), Crisp (1995: 1176, partly), Jeanes (1996: 761, partly), Crisp (2002: 524, partly), Craigie (2015: 29, partly).]

Erect, bushy *shrubs*, to 2 (3) m tall, glabrous, dull green to yellowish green. *Root anatomy* is initially normal (unistelar) but later secondary thickening is anomalous (cord roots). *Branchlets* thick, rigid,  $\pm$  smooth. *Phyllodes* 0–6(–8) and, when present, only near apex of each seasonal branchlet and reduced to scales at lower nodes, spreading at  $90^\circ$  or nearly so, pungent-tipped, inarticulate and continuous with the branchlet, 0–15(–25) mm long with little (if any) increase in length down the branchlet, 1–1.75 mm diam., rigid, smooth or obscurely ribbed. *Unit inflorescences* 1 per axil, racemose, 4- or more-flowered; *peduncle* 0.5–4 mm long; *rachis* 1.5–12 mm long; *subtending bracts* spreading, oblong, apex acuminate, 0.5–1 mm long. *Pedicels* 1–7 mm long. *Calyx* 2.5–3.5 mm long including the 1–1.5 mm receptacle; lobes equal or upper 2 united slightly higher than the lower 3, acuminate or upper 2 apiculate, 0.5–0.75 mm long. *Corolla: standard* transversely elliptic, retuse, 3–5  $\times$  4–5.5 mm including the ca. 1.5 mm claw; adaxially orange-red grading to yellow at margins with a central yellow oblong guide-mark, abaxially deep purple-brown and yellow; *wings* obovate, rounded and incurved but not enclosing the keel, auriculate, 4.5–5  $\times$  1.75–2.5 mm including the ca. 1.5 mm claw, orange-brown grading to yellowish at the tip; *keel* half transversely broadly elliptic, acute, auriculate, saccate, 4  $\times$  1.5 mm including the 1.5 mm claw, white with a deep red-purple tip. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* very broadly obovate to obtriangular, scarcely acute to slightly obtuse, strongly compressed, 5–7  $\times$  4–6 mm, slightly rounded in outline; upper suture slightly sigmoid; lower suture acute but broadly rounded. *Seed* compressed, ellipsoid, ca. 2–3 mm long, 2 mm broad, 1 mm thick; *aril* ca. 0.75 mm long. (Fig. 75).



**FIGURE 75.** *Daviesia aphylla*. A–D. Branchlet tips showing variation in phyllode and inflorescence development. A, B from Crisp 5964; C, D from J.M. Black s.n., October 1924 (AD: type of the synonym *D. nudula*). Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Flowering period:**—August to October. *Fruiting period:* October to January.

**Distribution:**—Widespread throughout the wheatbelt and mallee districts of Western Australia, eastward through the southern goldfields, Great Victoria Desert and Nullarbor Plain fringes, and across the mallee districts of South Australia to Renmark near the Victorian border.

**Habitat:**—Grows in a variety of soils, from sand, sandy loam and calcareous sand to loam and clay in *Eucalyptus*-dominated heath or woodland, or mallee with a dense *Melaleuca* understorey, or mallee eucalypts with *Triodia*.

**Selected specimens (138 examined):**—**WESTERN AUSTRALIA. Coolgardie:** Noongar, 31°20'S, 118°58'E, *R. Coveny 8376* & *B. Habersely*, 12 September 1976 (CANB, NSW); ca. 80 km SSW of Coolgardie at road junction 5 km S of Pigeon Hole Gnamma Hole, 32°31'S, 120°50'E, *M.D. Crisp 5924 et al.*, 18 September 1979 (CBG); Jaurdi Station, 16 km S of homestead, 30°57'S, 120°13'E, *M.D. Crisp 10101* & *L.G. Cook*, 1 October 2005 (CANB, PERTH); 12 km along Norseman–Hyden Road, from turnoff 8 km N of Norseman along road to Coolgardie, 32°11'S, 121°37'E, *M.D. Crisp 9540* & *L.G. Cook*, 13 October 2002 (CANB). **Eyre:** Lort River, W of Grass Patch, 33°38'S, 121°18'E, *J.S. Beard 5401*, 1 November 1967 (PERTH); Balladonia Road, W of Mt Ragged, 33°27'S, 123°26'E, *M.D. Crisp 9427* & *L.G. Cook*, 20 September 2002 (CANB, PERTH); 25 km from Borden along road to Albany (Chester Pass Road) and 3 km S of Amelup, 34°16'S, 118°12'E, *M.D. Crisp 9490* & *L.G. Cook*, 3 October 2002 (CANB, PERTH); Oldfield River at crossing of the Esperance–Ravensthorpe road, 32°41'S, 120°39'E, *A.E. Orchard 1525*, 13 October 1968 (AD, CANB, PERTH). **Helms:** Site 1, 28 km NW of Queen Victoria Spring, 30°16'S, 123°20'E, *D.J. Pearson 1189*, 16 July 1991 (CANB, PERTH). **Roce:** 61 km directly WSW of Salmon Gums, track W of end of Pyramid (Hill) Road, 33°09'S, 121°01'E, *M.D. Crisp 9535* & *L.G. Cook*, 12 October 2002 (CANB, PERTH). **SOUTH AUSTRALIA. Nullarbor:** N of Hughes, 30°43'S, 129°31'E, *W.S. Reid s.n.*, 12 July 1967 (AD 98675958). **Eyre Peninsula:** Lock, 33°34'S, 135°46'E, *leg. Veitch s.n., sine die* (AD 97622184). **Murray Basin:** 10.9 km directly NNE of Taylorville, alongside a graded track, 34°02'S, 140°03'E, *M.D. Crisp 9410* & *L.G. Cook*, 24 October 2001 (AD, CANB); Canegrass Station, 33°35'S, 140°01'E, *C.S. Robinson 85*, 21 October 1965 (AD); 3 km E of Stony Pinch Dam on south Calperum Road off Old Coach Road, 34°07'S, 140°36'E, *D.E. Symon 3852*, 11 October 1965 (AD, AHUC, CANB, K).

**Affinity:**—Although *D. aphylla* can be difficult to distinguish morphologically from *D. benthamii* and *D. purpurascens*, the molecular phylogeny indicates that it comprises a strongly supported clade (by that name: VII.b, Fig. 1B), which excludes the other two species. *Daviesia purpurascens* differs in having purplish or pruinose phyllodes, branchlets and pods, and the pods are oblong in shape and do not dehisce elastically. *Daviesia benthamii* differs in having usually six or more well-developed phyllodes diverging at 45–60° along the upper ca. 2/3 of the branchlet. The phyllodes are 15–50 mm long and increasing in length (up to 100 mm) down the branchlet. Two specimens from the Mullewa–Morawa area (WA) resemble *D. aphylla* morphologically by having few, short phyllodes near the branchlet apex (*Woolcock D235*) or are leafless (*Demarz 6890*) but DNA sequences unambiguously place them with *D. benthamii*, not with *D. aphylla*. Leafless specimens of *D. aphylla* resemble *D. scoparia*, which differs in having an erect, broom-like habit, branchlets that are striate when dry and larger bracts (ca. 1 mm long). *Daviesia scoparia* is always strictly leafless, whereas a few spinescent phyllodes can always be felt on some branchlets of *D. aphylla* plants.

**Variation:**—Plants from the eastern parts of the species' range (Great Victoria Desert and Nullarbor Plain in WA, and in SA) tend to have longer inflorescences (including peduncles, rachises and pedicels) but these intergrade continuously with the short-inflorescence populations and do not appear to warrant taxonomic status. The informal phrase-name *D. sp. Kanandah* (*R. Davis 10604*) has been used for such material in PERTH.

Specimens from near the WA south coast, in the vicinity of Jerramungup–Ravensthorpe and Fitzgerald River National Park, appear intermediate between *D. benthamii* and *D. aphylla* but most likely are a form of the latter (e.g. *Kern et al. LCH 17265*, *Davis 2226*, *Gardner s.n. PERTH 05496233* and *George 10535*). Other specimens from the south coast (e.g. Ravensthorpe and Pallinup River) previously identified as *D. benthamii* subsp. *benthamii* are hybrids between *D. aphylla* and *D. nematophylla*. See discussion under *D. nematophylla*.

**Hybrids:**—*Daviesia aphylla* × *nematophylla*, *D. aphylla* × *purpurascens*—see discussion under *D. nematophylla* and *D. purpurascens*. *D. aphylla* × *argillacea* (*Thompson & Allen 1140*, PERTH)—an 'isolated', morphologically intermediate plant in a mixed population of the parental species.

**75. *Daviesia campephylla*** Crisp (1995: 1180). Type: Western Australia, Roe, 45 km NNE of Munglinup, ca. 33°20'S, ca. 121°01'E, *K. Newbey 8162*, 14 November 1980. Holotype: CBG; isotypes: K, PERTH

Low, spreading, often domed *shrubs*, 0.15–0.35 m high, 0.3–1 m broad, often reproducing by suckers, scaberulous on branchlets and phyllodes. *Root anatomy* anomalous (cord type) or normal (unistelar). *Branchlets* ascending, terete, lightly ribbed or longitudinally wrinkled, minutely scabrous. *Phyllodes* moderately crowded, ascending at ca. 45° but tending to bend irregularly and resembling looping caterpillars, often sigmoid, linear-clavate, terete or slightly vertically compressed, dilated distally so that the pungent apex projects obliquely, gently tapered to base, slightly thickened above the basal articulation, 6–16(–20) × 1–2 mm, minutely scabrous, with a shallow groove along each side, green. *Unit inflorescences* usually solitary in upper axils, racemose, 1–5-flowered; *peduncle* 0–1 mm long; *rachis* 0–4 mm long; *subtending bracts* appressed, ovate or oblong, with fimbriate margins, 1 mm long. *Pedicels* 1–4 mm long. *Calyx* 3–5 mm long, ± constricted at base into a ca. 1 mm long stipe-like receptacle; upper 2 lobes apiculate, united in a truncate, emarginate lip; lower 3 lobes triangular, apiculate, ca. 1 mm long. *Corolla* predominantly yellow with faint red markings; *standard* remaining partially folded at anthesis, very broadly ovate, emarginate, truncate or cordate at base, 5.5–7 × 5–7 mm including the 1–1.5 mm claw; *wings* broadly spatulate with rounded, incurved, overlapping apices, auriculate, 5–6 × 3 mm including the 1–2 mm claw; *keel* half broadly ovate, gently falcate, apex acute, saccate, auriculate, 5–5.5 × 1.5 mm including the 2 mm claw. *Stamens* slightly dimorphic: inner whorl of 5 with longer, narrower, terete filaments and shorter, subversatile anthers; outer whorl of 5 with shorter, broader compressed filaments and longer, basifixed anthers; filaments free, overlapping; anthers all oblong, 2-celled. *Pod* surrounded by persistent floral parts, obliquely obtriangular, acute, compressed, thin-walled, 5–7 × 3.5 mm; upper suture dilated near the apex, lower suture shallowly curved. *Seed* ellipsoid, 3.25 mm long, 1.75 mm broad, 0.75 mm thick, yellow-brown; *aril* oblong, 1 mm long. (Fig. 76).

**Flowering period:**—November. **Fruiting period:** February.

**Distribution:**—Western Australia, known from a restricted area between Pyramid Lake (Cascade area) and Oldfield, north of Munglinup.

**Habitat:**—Occurs in shallow sandy loam with some lateritic gravel, over clay loam on a flat terrain on roadsides and also in the adjacent mallee dominated by eucalypts with a shrub understorey.

**Additional specimens examined:**—WESTERN AUSTRALIA. **Roe:** Ca. 95 km ENE of Ravensthorpe, 45 km NNE of Munglinup, 33°20'S, 121°01'E, *K. Newbey 9685*, 22 November 1982 (CBG, MEL, NSW, PERTH); *ibid.*, *K. Newbey 9722*, 23 February 1983 (CBG, PERTH); ca. 8 km SE of Pyramid Lake, Rollond Road, 20 km from Fields Road towards Cascade Road, 33°16'S, 121°02'E, *J. Taylor 1666 & P. Ollerenshaw*, 11 September 1983 (AD, CBG, MEL); *ibid.* except 22 km from Field's Road towards Cascade Road, 33°17'S, 121°01'E, *J. Taylor 1668–9 & P. Ollerenshaw*, 11 September 1983 (CBG, MEL, PERTH).

**Affinity:**—This is a morphologically distinctive species. The upward dilation of the phyllodes and oblique black cusp at their apex, together with their angle and colour create a strong impression of small green looping caterpillars rearing from the branchlets. The flowers and fruits do not closely resemble those of any other species. In certain forms of *D. physodes* and *D. incrassata*, some of the upper phyllodes are subterete and dilated near the apex, and resemble those of *D. campephylla*. However, the phyllodes of *D. incrassata* differ in being continuous with the branchlets. Both *D. physodes* and *D. incrassata* differ from *D. campephylla* in having glaucescent and highly variable phyllodes. Towards the base of these plants, the phyllodes become vertically flattened and several millimetres broad. Both have larger (ca. 12 × 10 mm), turgid pods and petals with pink and dark red markings. Another species with phyllodes that are green, terete, pungent, articulate and scaberulous is *D. articulata*, but it differs in having needle-like, widely spreading phyllodes with no upward dilation. *Daviesia asperula* also has pungent, articulate, scaberulous phyllodes, but they are striate with multiple nerves and are either subulate (ie. tapered upwards, not downwards) or falciform; most importantly, they are not dilated near the apex, and the apical cusp is in line with the direction of the phyllode. Also, in *D. asperula* the petals are orange-yellow with strong (not faint) red markings.

The molecular phylogeny shows *D. campephylla* to be nested within *D. aphylla* (clade VII.b, Fig. 1B) but the latter differs in having short (< 20 mm) divaricate, straight phyllodes that are restricted to the branchlet apex and are continuous (not articulate) with the branchlet.



FIGURE 76. *Daviesia campephylla*. Holotype. Photograph provided by the Curator of CANB.

**76. *Daviesia articulata*** Crisp (1995: 1173). Type: Western Australia, Roe, ca. 30 km E of Ravensthorpe, 8 km WNW of trig ESA5, 33°38'S, 120°22'E, *M.D. Crisp 6058*, *J. Taylor & R. Jackson*, 22 September 1979. Holotype: CBG; isotypes: AD, CANB, K, MEL, NSW, PERTH

Procumbent, spreading or erect, rigid *shrubs*, to 1 m tall and 2 m broad, minutely scabrous on vegetative parts, tending to hirsute in south-eastern plants. *Root anatomy* unknown. *Branchlets* numerous, divaricate, short, terete, obscurely striate when dry. *Phyllodes* evenly scattered, situated on thickened nodes, spreading, subulate, terete, straight or gently recurved, acuminate and pungent at the apex, articulate and abruptly thickened at the base, 3–40 × 0.75–1.25 mm, wrinkled upon drying, rigid and easily broken away, glossy, dark green. *Unit inflorescences* racemose, 1 per axil, 1–5-flowered; *peduncle* ca. 1 mm long; *rachis* 1–8 mm long; *subtending bracts* recurved, oblong or spatulate, obscurely trilobed, ca. 0.5 mm long. *Pedicels* narrowly clavate, 0.5–3 mm long. *Calyx* 2.5–4 mm long, tapered at base into the ca. 1 mm long, stipe-like receptacle, lobes shortly fimbriate; upper 2 lobes united in a truncate, emarginate lip; lower 3 lobes triangular, acuminate, ca. 1 mm long. *Corolla: standard* strongly recurved, very broadly ovate, emarginate, cordate, ca. 7 × 7.5 mm including the 2 mm claw, outer portion pure yellow, centre intensely yellow surrounded by a red starburst-like border (fading); *wings* obovate, with rounded, strongly incurved and overlapping apices, auriculate, ca. 6.5 × 2 mm including the 2 mm claw, red with yellow tips; *keel* half very broad-elliptic, scarcely acute, saccate, auriculate, ca. 5 × 1.5 mm including the 2 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, angular-terete filaments and versatile, ovoid anthers with confluent thecae; outer whorl of 5 with shorter, strongly compressed filaments and basifixed, obloid, 2-celled anthers; filaments free. *Pod* obliquely broadly obtriangular, acuminate, compressed, 8–11 × 4.5–6 mm, glossy, red-brown; upper suture sigmoid and lower suture sharply curved. *Seed* not seen. (Fig. 77).

**Flowering period:**—August to December. *Fruiting period:* January.

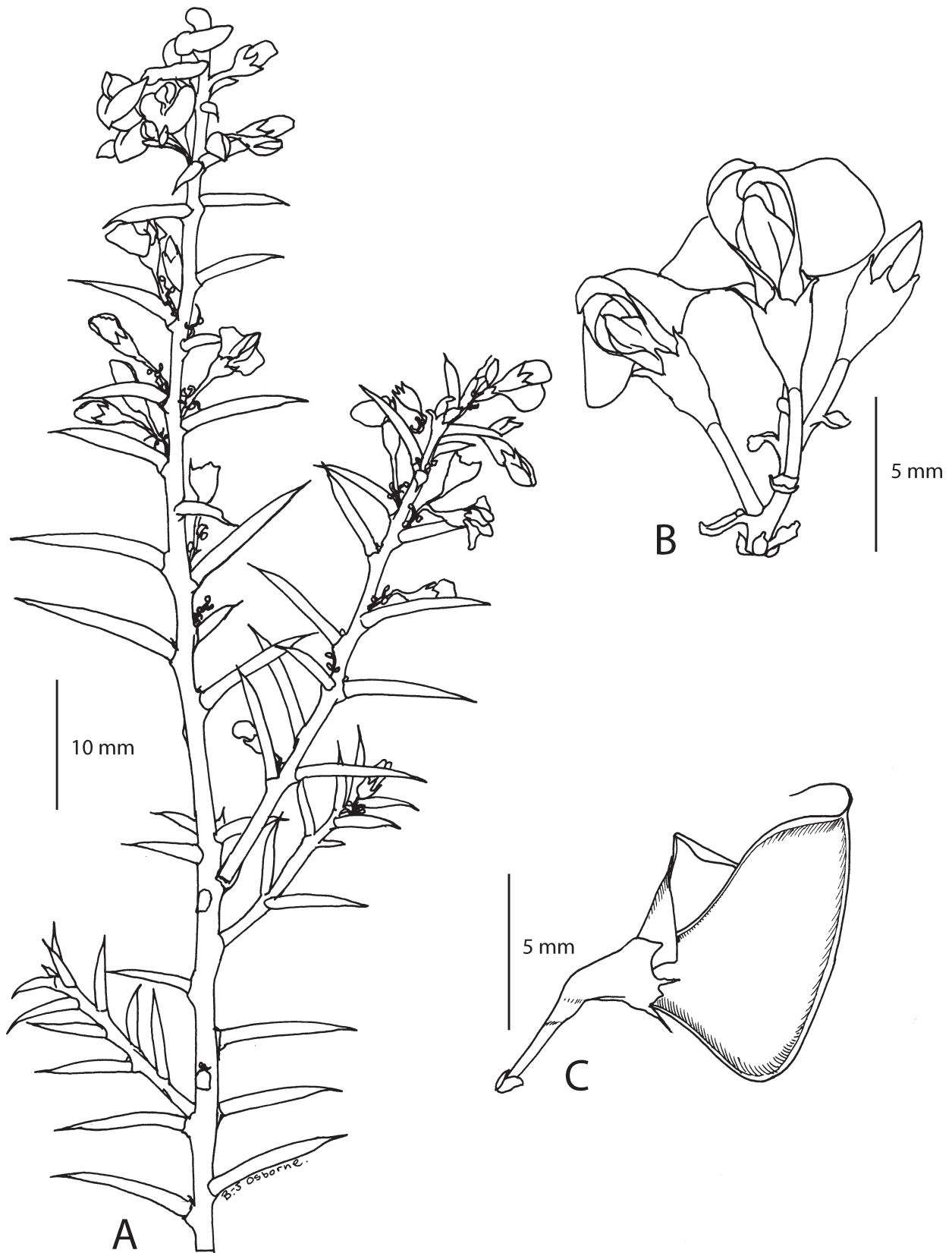
**Distribution:**—Western Australia, scattered across the southern wheatbelt and mallee districts, in an area bounded approximately by Kellerberrin in the north, Kojonup in the west, the Stirling Range in the south, and Salmon Gums–Esperance in the east.

**Habitat:**—Grows in soils such as sand, sandy loam or most commonly clay, sandy clay or gravelly clay, on slopes or plains, under mallee eucalypts with a shrub understorey (e.g. broombush *Melaleuca*), or in woodland dominated by eucalypts such as *E. wandoo*.

**Selected specimens (17 examined):**—**WESTERN AUSTRALIA. Avon:** 7 km from Nyabing along road to Katanning, 33°34'S, 118°04'E, *M.D. Crisp 5201*, 16 January 1979 (CBG, PERTH). **Coolgardie:** Bremer Range, 32°31'S, 120°46'E, *C.A. Gardner s.n.*, November 1929 (PERTH 5481368). **Roe:** Near 105 mile peg, Borden–Pingrup road, *A.M. Ashby 4666*, 9 September 1972 (PERTH); ca. 50 km WSW of Salmon Gums, 23 km NW of Roberts Swamp, 33°07'S, 121°09'E, *K. Newbey 8195*, 13 November 1980 (PERTH); W of Salmon Gums, Frank Hann National Park, 32°45'S, 121°09'E, *R.D. Royce 10216*, 10 December 1971 (PERTH, SYD); 11 km E of Ongerup, 33°47'S, 118°36'E, *K. Newbey 1480*, 26 September 1964 (PERTH); 2.4 km S of cross-roads Forrestania, 32°25'S, 119°45'E, *F. Lullfitz 3969*, 8 December 1964 (PERTH); near Scaddan, 33°27'S, 121°44'E, *M.D. Crisp 9949 & L.G. Cook*, 16 September 2005 (CANB, PERTH); ca. 1.3 km SE of intersection of Rhinds Road and Dalyup Road, 33°20'S, 121°35'E, *E.M. Sandiford 120* (PERTH). **Eyre:** SW of Eyre Range, 33°51'S, 119°59'E, *A.S. George 7227*, 1 November 1965 (PERTH); Phillips flats and near East Mt Barren, *G. Maxwell s.n., sine die* (MEL 72501).

**Affinity:**—*Daviesia articulata* is perhaps most similar to *D. genistifolia*, which it resembles in most respects, despite a geographic separation of > 1500 km. The smooth (not scaberulous) surface and dull, light grey-green colour of the phyllodes of *D. genistifolia* readily distinguish it from *D. articulata*. In addition, *D. genistifolia* has floral differences: the base of the standard is truncate or broadly fan-shaped, the wings are ≤ 5.5 mm long, only slightly incurved and scarcely overlapping at the apices, the standard has a large central semi-circle infused with dark red and the tips of the wings are red (red infusion fading grey with age).

Another taxon that may be confused with *D. articulata* is *D. asperula* subsp. *asperula*, which is not especially closely related, but also has scaberulous branchlets and phyllodes. *Daviesia asperula* differs from *D. articulata* in having dull, grey-green, striate phyllodes, a standard-petal with a broadly fan-shaped base and a pod with a less sharply curved lower suture. The floral markings of *D. asperula* are very similar to those of *D. genistifolia* and, in this respect, also differ from those of *D. articulata*.



**FIGURE 77.** *Daviesia articulata*. A. Flowering branchlet. B. Inflorescence. C. Pod with persistent standard. A, B from *Crisp 6058*; C from *Crisp 5201*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.



Many species of *Daviesia*, too numerous to mention here, have more or less terete, pungent, articulate phyllodes and could be confused with *D. articulata*. All are more distantly related to *D. articulata* than are *D. genistifolia* and *D. asperula* and can be distinguished by floral and fruiting characters. The two species with perhaps the strongest superficial resemblance to *D. articulata* are *D. angulata* and *D. preissii*, both being distinguished by their larger (13–20 mm long), turgid pods. In *D. angulata*, the branchlets differ from those of *D. articulata* in being angular with sharp ridges. The phyllodes of *D. preissii* differ from those of *D. articulata* in being striate, smooth (not scaberulous) and usually compressed or flattened in the vertical plane, and the pods are turgid and much larger. The molecular phylogeny shows *D. articulata* to be nested within *D. aphylla* (clade VII.b, Fig. 1B) but the latter differs in having short (< 20 mm) divaricate phyllodes that are restricted to the branchlet apex and are continuous (not articulate) with the branchlet.

**Variation:**—Plants in the eastern portion of the species' range (e.g. *Crisp 9949* and *Sandiford 120*) tend to be shortly hirsute, with gently recurved, short (2–15 mm long) phyllodes. Otherwise, they intergrade imperceptibly with typical populations and are not recognised here as a distinct taxon.

### 77. *Daviesia scabrella* Crisp, *sp. nov.*

Closely related to *D. articulata*, with which it shares needle-like phyllodes, a minutely scabrid epidermis and a distinctive starburst central mark on the standard, but differing in having a gracile, vegetatively spreading habit and lacking an articulation at the base of the phyllode. *Daviesia devito* and *D. schwarzenegger* are similar but their epidermis is smooth and the central mark on the standard differs.

Type [approximate locality data given because the species is rare]: WESTERN AUSTRALIA: Eyre District, near Condingup, ca. 33°30'S, 122°50'E, *M.D. Crisp 11358*, 15 October 2012. Holotype: CANB 812655; isotype: PERTH.

Dense, intricate, procumbent, spreading *shrubs* to 0.5 m high and several m across, probably rooting at nodes, minutely scabrous on vegetative parts, dull green. *Root anatomy* unclear, possibly developing anomalous secondary thickening. *Branchlets* numerous, divaricate, tangled, short, terete, obscurely striate when dry. *Phyllodes* evenly scattered, spreading, subulate, terete, straight or gently incurved, acicular and pungent at the apex, inarticulate and continuous with the branchlet at the base, 5–25 mm long, ca. 1 mm diam. at the base, slightly wrinkled upon drying, dull light green. *Unit inflorescences* racemose, 1 or 2 per axil, 1–3-flowered; *peduncle* 0.5–1 mm long; *rachis* 0–1.5 mm long; *subtending bracts* ascending, rhombic, trilobed, 0.25–0.6 mm long. *Pedicels* terete, 1–1.8 mm long. *Calyx* 2.8–3.6 mm long, tapered at base into the ca. 0.75 mm long, stipe-like receptacle, ± infused with purple-grey, lobes obscurely fimbriate at tips; upper 2 lobes united in a truncate, emarginate lip; lower 3 lobes triangular, acuminate, 0.6–1 mm long. *Corolla: standard* recurved, transversely broadly obovate, emarginate, ca. 5 × 5.5 mm including the 1 mm claw, outer portion pure yellow, centre intensely yellow surrounded by a red starburst-like border (fading); *wings* obovate, with rounded, strongly incurved and overlapping apices, auriculate, with a shallow sinus on the abaxial margin, ca. 4.5 × 2 mm including the 1.5 mm claw, yellow with variable red infusion centrally; *keel* strongly incurved, half transverse-broad-elliptic, acute, saccate, auriculate, ca. 3.4 × 1.2 mm including the 1.5 mm claw, dull red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, slightly compressed filaments and versatile, ovoid anthers with confluent thecae; outer whorl of 5 with strongly compressed filaments and basifixed, obloid, 2-celled anthers; filaments free. Pod obliquely broadly obtriangular, acuminate, compressed, 6–7 × 4–4.5 mm, semi-glossy, pale brown; upper suture sigmoid, lower suture curved through 80–120°. *Seed* not seen. (Fig. 78).

**Etymology:**—The specific epithet, from Latin and meaning covered with minute hard points, refers to the texture of the epidermis.

**Flowering period:**—October. *Fruiting period:* unknown.

**Distribution:**—Western Australia, known only from the type locality and its vicinity ca. 100 km east of Esperance.

**Habitat:**—On an undulating plain in thin white sand over yellow-brown cracking clay, with calcrete nodules. In mallee-heath dominated by various eucalypts above several species of *Melaleuca*, *Nematolepis phebaloides* Turczinow (1852: 158) and *Daviesia lancifolia*.

**Conservation status:**—Unknown. Although this species is known only from the type population, it occurs in a remote area at the edge of extensive tracts of uncleared land that has not been well-explored botanically.



FIGURE 78. *Daviesia scabrella*. Holotype. Photograph provided by the Curator of CANB.

**Additional specimen examined:**—[Approximate locality data given because the species is rare]. **WESTERN AUSTRALIA. Eyre:** near Condingup, 33°30'S, 122°40'E, C.D. Turley & R.M. Hoggart BS 21/10-2008, 3 October 2008 (PERTH).

**Affinity:**—This is one of the many species in the genus with needle-like phyllodes. Despite a strong superficial resemblance to *D. devito* this species is more closely related to *D. articulata* and *D. campephylla* (clade VII.b, Fig. 1B), with which it shares a scaberulous (to hispidulous in the latter) epidermis and very similar floral morphology including a distinctive starburst-like central marking on the standard (Fig. 78B). The new species is easily distinguished from both *D. articulata* and *D. campephylla* by its inarticulate phyllode insertion, and also by its procumbent, widely spreading and more gracile growth habit. In general habit, and also in lacking an articulation at the phyllode base, *D. scabrella* resembles *D. devito* and *D. schwarzenegger*, but both the latter are restricted to eastern Australia and have a more robust growth habit, especially *D. schwarzenegger*. More specifically, both the latter have a smooth epidermis, in contrast to the minutely scabrid epidermis of *D. scabrella*. Also, *D. devito* differs in having small, black, triangular stipules—there are none in *D. scabrella*—and the mark on the standard of *D. devito* is broad, dark red and circular with a narrow, vertical yellow line at the centre, as in its sister species, *D. genistifolia* (q.v.).

*Daviesia rhizomata* resembles *D. scabrella* in growth-habit, with needle-like inarticulate phyllodes and a low spreading rhizomatous growth habit but the plant is glaucescent to bluish and the floral morphology differs, e.g. the standard has incurved margins and the central yellow mark is vertical and linear, not starburst-shaped. *Daviesia benthamii* and *D. genistifolia* differ from *D. scabrella* in having a non-scaberulous epidermis and additionally *D. genistifolia* has articulate phyllode bases. Although the molecular data indicate that *D. scabrella* is closely related to *D. aphylla*, the latter has a smooth epidermis, erect growth habit and phyllodes that are shorter (mostly  $\leq 15$  mm long), thicker (1–1.5 mm diam.) and only developed towards the branchlet apex, if at all.

### VII.c. *D. genistifolia* Clade

**78. *Daviesia genistifolia*** A.Cunn. ex Benth (1837a: 75), Benth (1864: 82), Crisp (1982b: 55–62); Stanley & Ross (1983: 253), Crisp (1995: 1193), Jeanes (1996: 761), Craigie (2015: 30). Type: ‘Hunters River A. Cunningham.—Ora occidentali-australis? F. Bauer.’ Lectotype (Crisp 1995: 1193): Hills on Hunter’s River, N.S. Wales, A. Cunningham, 1825 (W); isolectotype: BM, G, K (2 sheets). Syntype: Nova Hollandia ora occident. austr., Ferd. Bauer: K, W; isosyntype: PRC

*Daviesia colletioides* A.Cunn. ex Benth (1837a: 75). *Daviesia genistifolia* A.Cunn. ex Benth. var. *collettioides* (A.Cunn. ex Benth.) Benth (1864: 82). Type: ‘In Nova Cambria australi interiore. A. Cunningham...(v.s.)’. Lectotype (Crisp 1995: 1194) N.W. interior, N.S. Wales A. Cunningham, 1822 (W); isolectotype: CGE; isolectotype or syntype: N of Bathurst, N.S.W., A. Cunningham, 1822 (E, K (3 sheets), NY).

[*Daviesia coluteoides* A.Cunn. ex Walpers (1842: 570). Type: ‘Crescit in Nova Hollandia’ Type specimen unknown. Note: Probably a misspelling of *D. colletioides* A.Cunn. ex Benth.]

*Shrubs* varying from multi-stemmed and low (to 0.6 m), to slender and open, to 2 m high, glabrous. *Root anatomy* with anomalous secondary thickening (cord-rooted). *Branchlets* spreading to ascending, terete, longitudinally ribbed when dry. *Phyllodes* scattered, diverging at ca. 45°, terete or angular or vertically compressed in transection, apically acuminate or acicular, pungent, articulate at base, 5–30 (50) mm long, 0.5–1.25 mm thick, usually striate when dry, rigid, dull green or glaucescent; minute, dark red, triangular stipules present in some populations (e.g. in the Flinders Ranges of SA, near Chiltern in Vic. and in central Qld). *Juvenile phyllodes* elliptic, pungent, 45–70 × 8–9 mm, venation prominent, reticulate. *Unit inflorescences* 1 or 2 per axil, racemose, 2–6-flowered; *peduncle* 0.5–1.3 mm long; *rachis* 1–8 mm long; *subtending bracts* ascending to erect, oblong, hooded, ca. 1 mm long. *Pedicel* 1–3 mm long, slightly thicker than receptacle near the articulation. *Calyx* 2–4 mm long including the 0.5–1 mm receptacle; upper 2 lobes united into a truncate emarginate lip, lower 3 acute with shallow sinuses, ca. 0.5 mm deep. *Corolla: standard* depressed-ovate, emarginate, somewhat cordate, with the upper margins incurved, 4.5–5.5 × 5–6.5 mm including the ca. 1.5 mm claw, outer part yellow or orange-yellow, inner part a large central semi-circle infused with dark red (ageing grey-brown), with a linear central yellow mark; *wings* obovate, rounded and incurved to enclose the keel, auriculate, 5–5.5 × 2–2.25 mm including the ca. 1.5 mm claw, deep red, fading to yellow at the apex; *keel* half transversely broadly elliptic, acute, auriculate, saccate, 4–4.5 × 1.75–2 mm including the ca. 1.5 mm claw, maroon. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, subversatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong,

basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, scarcely acute, compressed, 8–11 × 4–8 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, compressed, 3–4.5 mm long, 2–3.2 mm broad, 1.3–1.2 mm thick, dark brown; *aril* oblong or narrowly so, ca. 2 mm long. (Fig. 79).

**Common name:**—Broom Bitter-pea.

**Flowering period:**—August to October. *Fruiting period:* October to December.

**Distribution:**—Widespread in eastern Australia, extending along the Great Dividing Range and its western slopes from central Queensland southward through New South Wales to eastern Victoria (Chiltern area); also in the Flinders Ranges, South Australia. Records from farther south in SA, and from the western plains of Vic. and NSW, are likely misidentifications of *D. devito* and *D. schwarzenegger*.

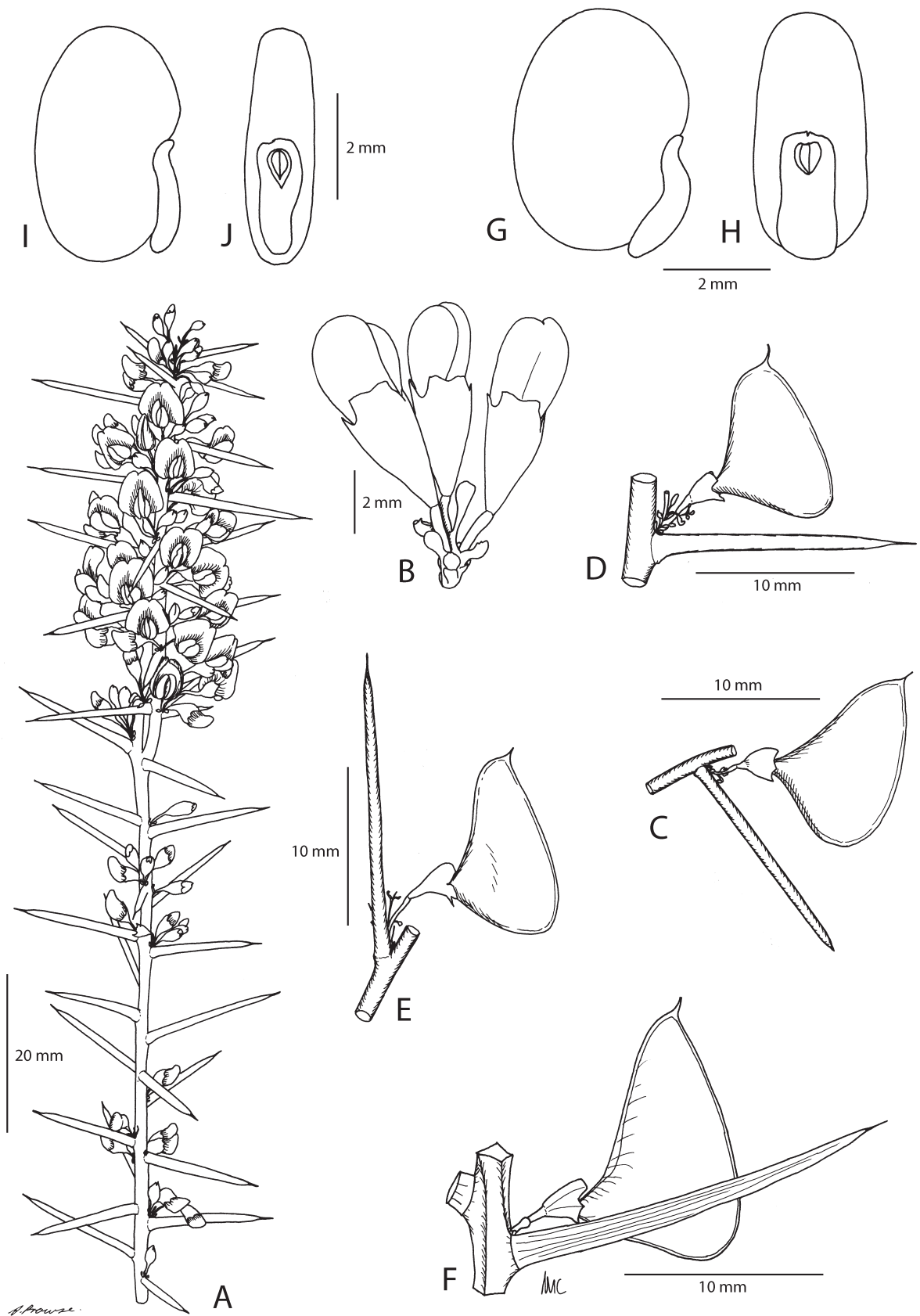
**Habitat:**—Widespread in sclerophyll communities.

**Conservation status:**—National: Not listed. Vic.: Rare in that state but not considered otherwise threatened—there are relatively few known populations but the species occurs extensively in New South Wales and Queensland.

**Selected specimens (278 examined):**—**SOUTH AUSTRALIA. Flinders Ranges:** Tarcowie Common, ca. 26 km W of Peterborough, 32°57'S, 138°31'E, *M.G. Catford s.n.*, 15 November 1975 (AD, CBG 60895); Oraparinna National Park, creekline along E side of Aroona Valley, 30°33'S, 138°17'E, *D.E. Symon 7296*, 13 September 1971 (AD). **QUEENSLAND. Leichhardt:** Carnarvon Creek, [Carnarvon] National Park, 24°44'S, 147°40'E, *C. Gittins 402*, August 1961 (BRI). **Burnett:** Glenleigh, Monto Shire, 25°05'S, 151°05'E, *I. Romano s.n.*, 1975 (BRI 197043). **Moreton:** Petrie, 29 km N of Brisbane, 27°16'S, 151°59'E, *S.T. Blake s.n.*, 9 November 1931 (BRI 81185). **Darling Downs:** Western Creek State Forest, ca. 22 km WSW of Milmerran, Antonios Road, next to power line easement, 27°54'S, 151°02'E, *M.D. Crisp 11676*, 11 April 2015 (BRI, CANB); State Forest 444 Durikai, 28°12'S, 151°38'E, *P.I. Forster 11726 & P. Machin*, 27 September 1992 (BRI, CANB, MEL). **NEW SOUTH WALES. North Western Plains:** 8.7 km WSW of Narrabri West R.S. on the Wee Waa road, 30°21'S, 149°40'E, *R. Coveny 12339 & J. Dalby*, 9 September 1986 (CANB, NSW); Pilliga, 30°21'S, 148°53'E, *H. M.R. Rupp s.n.*, October 1932 (NSW 35740). **North-west Slopes:** Bowling Alley Point Common, S edge of Bowling Alley Point, 31°24'S, 151°08'E, *J.R. Hosking 1179*, 18 October 1995 (CANB, MEL, NE, NSW). **Northern Tablelands:** Walcha, ca. 30°59'S, 151°36'E, *J.H. Maiden s.n.*, November 1897 (NSW 35774). **North Coast:** Bowman & Barrington Rivers, *J.H. Maiden s.n.*, September 1897 (AD 96809177, NSW 35759); 1 km N of Woodenbong, 28°23'S, 153°37'E, *R. Coveny 5173*, 5 September 1973 (A, B, BRI, CANB, G, K, L, LE, MO, NSW, PRE, RSA). **Central-west Slopes:** Goulburn River Valley, 0.4 km S of Mt Kerrabee, 32°25'S, 150°18'E, *M.D. Crisp 2273 et al.*, 28 October 1976 (CBG, K, PERTH). **Central Tablelands:** Mt Tayar, 17.5 km ca. SE of Rylstone, 32°58'S, 150°13'E, *E.F. Constable 5055*, 24 September 1964 (NSW); ca. 32 km S of Orange, ca. 33°34'S, 149°06'E, *D.W. Shoobridge s.n., sine die* (CBG 864). **AUSTRALIAN CAPITAL TERRITORY.** 8 km NE of Barton Highway along Gundaroo Road, 35°09'S, 149°09'E, *M.D. Crisp 6730*, 15 September 1980 (CBG, MEL, MO, PERTH). **VICTORIA. Northern Plains:** SE of Bendigo, 1.3 km E of Costerfield P.O. along road to Nagambie, 36°52'S, 144°49'E, *G.W. Carr 7145*, 2 September 1976 (AD, BISH, BRI, CANB, K, MEL, MO, NSW, NY, PERTH, US); *ibid.*, *G.W. Carr 7195*, 16 December 1976 (CBG, CHR, MO). **CULTIVATED.** Australian National Botanic Gardens, Canberra, ex South Australia, Black Hill Flora Reserve, Athelstone, 1977, *M.D. Crisp 5672*, 2 March 1979 (CBG).

**Affinity:**—According to DNA sequences the sister species of *D. genistifolia* is *D. devito* (clade VII.c, Fig. 1B). Morphologically these two species are so similar that they have often been confused (Crisp 1982b). The stipules found in some populations of *D. genistifolia* closely resemble those of *D. devito*, though they are variably present in the former. *Daviesia devito* differs in having phyllodes continuous (not articulate) with the branchlet, smaller flowers (e.g. standard 3–5 × 4–5.5 mm) and smaller pods (5–7 × 4–6 mm). *Daviesia genistifolia* also resembles other species having pungent, more or less terete or angular phyllodes, such as *D. benthamii* and *D. schwarzenegger*, but these species lack stipules. The recurved acuminate calyx lobes of *D. benthamii* distinguish it from *D. genistifolia*, which has straight acute lobes. *Daviesia schwarzenegger* is also distinguished by the branchlets being wrinkled when dry, rather than ribbed or striate as in *D. genistifolia*.

*Daviesia genistifolia* has also been confused with linear-leaved specimens of *D. ulicifolia*. *Daviesia ulicifolia* is easily distinguished by its spinescent branchlets and horizontally (not vertically) compressed or flattened phyllodes, and it usually has 1-flowered or umbelliform inflorescences, which are rarely (subsp. *incarnata*) racemose as in *D. genistifolia*.



**FIGURE 79.** *Daviesia genistifolia*. A. Flowering branchlet. B. Inflorescence. C–F. Variation in phyllodes and pods. G–J. Seeds in lateral view (G, I) and hilar view (H, J). A, B from *Crisp 6730*; C from *Catford s.n.* (CBG 60895); D from *Maiden s.n.* (NSW 35774); E from *Crisp 2273*; F–H from *Carr 7195*; I, J from *Shoobridge s.n.* (CBG 864). Drawn by A.L. Prowse and M.D. Crisp. Partly adapted from Crisp (1980a) with permission from the Board of the Adelaide Botanic Gardens.

79. *Daviesia devito* Crisp & L.G.Cook, *nom. & stat. nov.*

Basionym: *Daviesia benthamii* Meisner (1844: 48) subsp. *humilis* Crisp (1982b: 60), Crisp (1995: 1176, partly), Crisp (2002: 524, partly), Jeanes (1996: 761, partly), Craigie (2015: 29, partly). Type [approximate locality data given because the species is rare in SA]: South Australia, Flinders Range, Wilpena Pound, 31°30'S, 138°40'E, *M.D. Crisp 931*, 22 October 1974. Holotype: CANB; isotype: K.

This species was previously included in *D. benthamii* as subsp. *humilis*, but here we divide that subspecies into two cryptic species (*D. devito* and *D. schwarzenegger*). *Daviesia devito* is distinguished from its cryptic twin *D. schwarzenegger* by having minute (ca. 1 mm), triangular, dark red stipules, ribbed rather than wrinkled branchlets and phyllodes (when dry), and its overall more slender, less robust appearance.

Dense, often depressed *shrubs*, 0.3–1(–1.5) m high, 0.5–1.5(–3) m wide, spreading from a central rootstock, glabrous, dull green to yellow-green. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending to divaricate, longitudinally ribbed or wrinkled when dried, glabrous, spinescent. *Phyllodes* scattered, divaricate, terete, apically acicular, pungent, basally inarticulate, 5–30 mm long, 1–1.75 mm diam. at base, ribbed when dried, reduced to scales towards the base of branches, or rarely absent along the entire branchlet length (e.g. *Bates 66311*, *Beaglehole 87537*); minute stipules consistently present as small, deltoid scales (< 1 mm long). *Unit inflorescences* single or paired racemes of 2–5 flowers in the axils; several *barren basal bracts* present, rachis mostly < 10 mm long, angular; *subtending bracts* keeled, striate, minutely ciliate at margins, reflexing from the base, 1.5 mm long, decurrent on the rachis, maroon and green; pedicels 1–1.5 mm long, not enlarging. *Calyx* ca. 2 mm long including receptacle, grey-purple, often with white pellucid dots, sometimes pruinose towards the base or viscid; upper lobes united into a narrow emarginate lip, lower lobes triangular, acute or apiculate, fimbriate on inner margins;. *Corolla*: *standard* transversely elliptic, retuse, 5–6 × ca. 5 mm including the ca. 1 mm claw; adaxially yellow to red, centrally yellow-green with a red-brown jagged margin; *wings* obovate, rounded and incurved but not enclosing the keel, auriculate, 4–4.5 × 1.75–2.5 mm including the ca. 1 mm claw, orange-brown; *keel* half transversely broadly elliptic, acute, auriculate, saccate, ca. 4 × 1.5 mm including the 1.5 mm claw, slightly beaked, deep maroon grading to whitish towards the base. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free. *Pod* very broadly obovate to obtriangular, scarcely acute to slightly obtuse, strongly compressed, 5–7 × 4–6 mm, slightly rounded in outline; upper suture slightly sigmoid; lower suture acute but broadly rounded. *Seed* turgid, reniform, ca. 2.8 mm long, 2 mm broad, 1.3 mm thick, cream with black mottling; *aril* cream to yellow, thickly lobed, continuous, 1.2–1.3 mm long. (Fig. 74C–J).

**Etymology:**—The name refers to the actor playing the diminutive twin in the Universal Studios film ‘Twins’ (1988). *Daviesia devito* is the less vigorous of two cryptic species into which we here divide *D. benthamii* subsp. *humilis*, in contrast to the much more robust *D. schwarzenegger* (see more detail under that species). The epithet has been changed, rather than simply making a new combination for the subspecies name (on whose type *D. devito* is based), to avoid confusion caused by splitting the subspecies into two species.

**Flowering period:**—September and October. *Fruiting period:* December and January.

**Distribution:**—This species is scattered through mallee districts from Eyre Peninsula in South Australia to western Victoria and north-east to Condoblin area, New South Wales.

**Habitat:**—Grows in a variety of substrates, e.g. skeletal or lateritic soils, sandy loam over limestone, or gravelly clay; in mallee dominated by *Eucalyptus* spp., but occasionally in heath or woodland.

**Conservation status:**—National: Not listed. SA: Rare (listed as *D. benthamii* subsp. *humilis*).

**Selected specimens (50 examined):**—Approximate locality data are given for SA because the species is listed as rare there. **SOUTH AUSTRALIA. Eyre Peninsula:** NW of Witera, ca. 33°00'S, 134°30'E, *J.D. Briggs 1158*, 8 September 1983 (AD, CBG, MEL, NSW); near Lock, 33°30'S, 135°50'E, *M.D. Crisp 9318 & L.G. Cook* (CANB, PERTH). **Lofty North:** NNE of Freeling, 34°20'S, 138°50'E, *M.D. Crisp 7903*, 1 January 1987 (AD, CBG, PERTH). **Lofty South:** N of Nuriootpa, 34°30'S, 139°00'E, *M.D. Crisp 9409 & L.G. Cook*, 24 October 2001 (CANB). **Murray Basin:** Monarto South area, 35°10'S, 139°10'E, *T. Reichstein TR1524*, 22 December 1971 (AD, CANB); Milang Area, 35°20'S, 139° E, *D.E. Symon 13280*, 13 October 1983 (CANB, K, L, MO, NA, US). **South-east:** near Wolseley, 36°20'S, 141°E, *R.J. Bates 66311*, October 2005 (AD). **NEW SOUTH WALES. South Western Plains:** NW of Condoblin, 32°50'S, 147°E, *G.M. Cunningham & P.L. Milthorpe 4107*, 26 October 1975

(CANB). **Central-west Slopes:** 1.1 km S of West Wyalong town limit along road to Narrandera (Newell Highway), 33°55'S, 147°11'E, *M.D. Crisp 9422 & L.G. Cook*, 14 September 2002 (CANB, NSW). **VICTORIA. Northern Plains:** Western Little Desert reference area, ca. 36°35'S, 141°05'E, *A.C. Beauglehole 87537*, 16 November 1986 (CANB, MEL); Wail State Forest, 36°30'S, 142°03'E, *A.C. Beauglehole 86133*, 15 October 1986 (CANB, MEL); 8 km from Wedderburn, towards Inglewood, 36°28'S, 143°42'E, *M.E. Phillips s.n.*, 31 October 1963 (CBG 3199); Inglewood Flora Reserve, 36°35'S, 143°52'E, *N.G. Walsh 2448* (CANB, MEL); *ibid.*, *M.D. Crisp 9557 & L.G. Cook*, 18 October 2002 (CANB).

**Affinity:**—This species was previously included in *D. benthamii* as subsp. *humilis*, but here we divide this subspecies into two cryptic species (*D. devito* and *D. schwarzenegger*), which DNA sequences have shown to be reciprocally monophyletic and more closely related to other species than to each other or to *D. benthamii* (Fig. 1B). Morphologically, *D. devito* immediately differs from the 3 other species previously included in *D. benthamii* (i.e. *D. aphylla*, *D. benthamii* s.s. and *D. schwarzenegger*) in having minute, triangular, dark red stipules at the base of the phyllodes. *Daviesia aphylla* (previously named as *D. benthamii* subsp. *acanthoclona*) overlaps in distribution with *D. devito* from southern WA to Eyre Peninsula, SA. *Daviesia aphylla* differs additionally in its tall habit (usually above 1 m) and the smooth or longitudinally wrinkled, terete branchlets that are almost leafless or have short (< 20 mm) phyllodes confined to the upper few nodes of the branchlets. *Daviesia schwarzenegger* is distinguished from its cryptic twin *D. devito* by the absence of stipules, wrinkled rather than ribbed branchlets and phyllodes (when dry), and its overall more robust appearance.

According to DNA sequences, the closest relative of *D. devito* is *D. genistifolia* and in fact they were previously considered conspecific (Crisp 1982b). However, *D. genistifolia* is readily distinguished by the articulation at the base of the phyllode, where it attaches to the branchlet. Additionally, the flowers and pods of *D. genistifolia* are larger than those of *D. devito*, e.g. standards respectively 4.5–5.5 mm long × 5–6.5 mm wide versus 3–4 mm long × 4 mm wide. The ranges of these two species overlap in the Flinders Ranges in SA, where they maintain these diagnostic differences. However, plants of *D. genistifolia* from the Flinders Ranges have stipules, like *D. devito* and unlike most other populations of *D. genistifolia*.

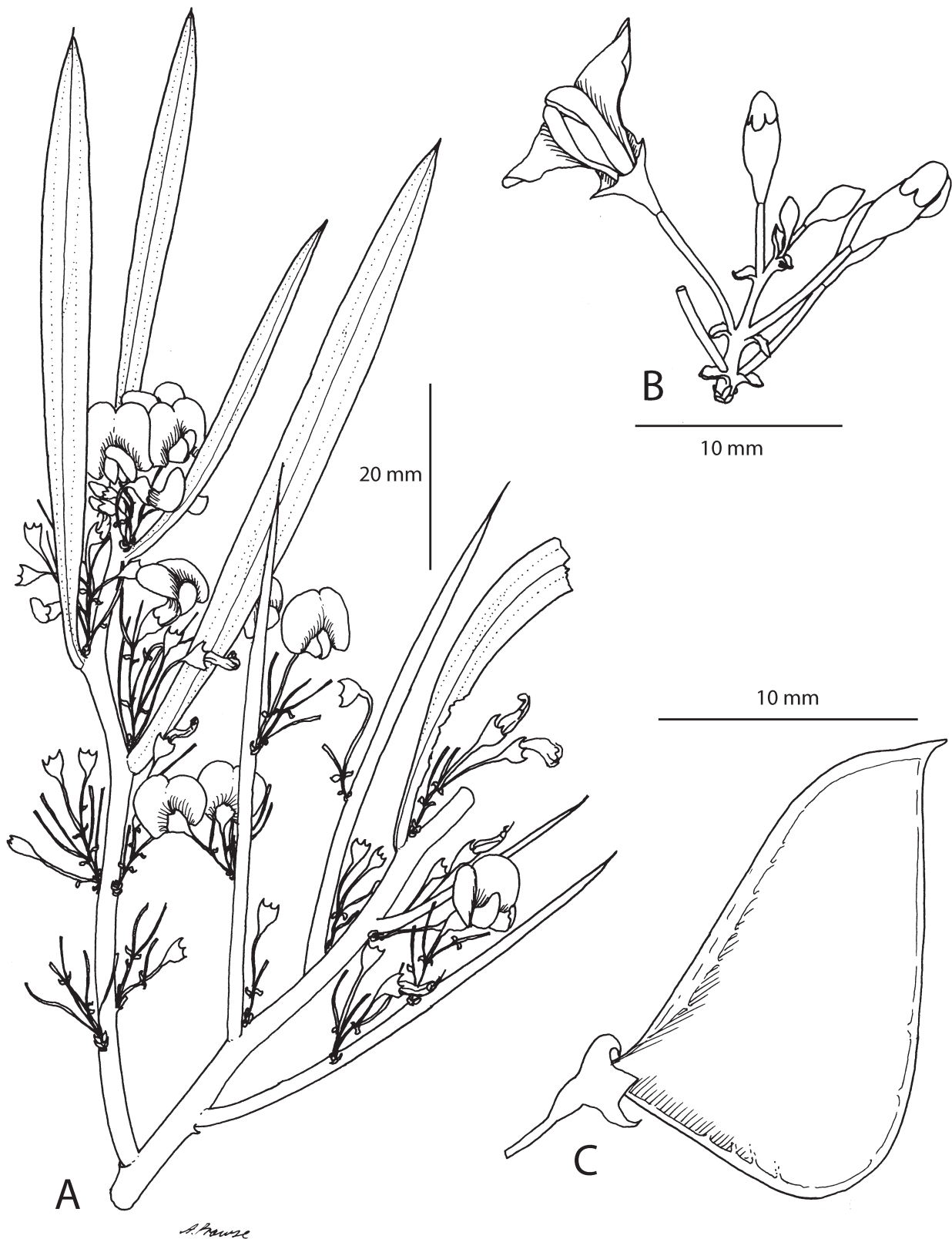
#### VII.d. *D. hakeoides-obovata* Clade

**80. *Daviesia horrida*** Preiss ex Meisner (1844: 54), Bentham (1864: 77), Crisp (1987a: 250), Crisp (1995: 1200), Wheeler *et al.* (2002: 743). Type: 'In regionibus interior. Australiae meridionali-occidentalis m. Nov. 1840. Herb. Preiss. no. 1142. et in limoso-arenosis ad latus montis prope cataractum ad caput fl. Cygnorum, d. 26. July 1839. No. 1171. (Drummond n. 230.)'. Lectotype (Crisp 1995: 1200): *Preiss 1171* (LD); isolectotype: BR, G (3 sheets), GOET (2 sheets), MEL (2 sheets), MO, NY, P (2 sheets), S, W (2 sheets). Syntype: *Preiss 1142* (LD, NY). Syntype: *Drummond 230* (BM); isosyntype: G (2 sheets), K (2 sheets), MEL, OXF, P (2 sheets), W (2 sheets)

Divaricate shrubs, 0.5–1.8 m high, glabrous, glaucous. *Root anatomy* normal (unistelar). *Branchlets* terete, rigid, spiny, striate when dry, upper branchlets becoming leafless. *Phyllodes* when present scattered to subopposite, spreading or ascending, narrowly elliptic or obovate, or linear, apically acute to scarcely so, with a small mucro, tapered to base or both ends, articulate, 18–130 × 1.5–20 mm, venation ± longitudinal, prominent when dry. *Seedling phyllodes* almost opposite, linear to narrow-elliptic or rarely -obovate, tapering to both ends, base constricted to a petiole-like base, venation prominent, 65–110 × 6–12 mm, not reduced to scales. *Unit inflorescences* 1 per axil, racemose, 3–10-flowered; *peduncle* ca. 1 mm long; *rachis* 1–20 mm long; *barren basal bracts* few, forming an involucre, appressed, oblong, ca. 0.5 mm long; *subtending bracts* spreading, oblong, slightly hooded, ca. 1.75 mm long. *Pedicels* 1–7 mm long. *Calyx* 4.5–5 mm long including the ca. 1.5 mm receptacle; lobes equal, acuminate, triangular, ca. 1 mm long. *Corolla: standard* transversely broadly elliptic, emarginate, 8–9 × 7–8.5 mm including the ca. 2.5 mm claw, orange with a dark red centre and a single central yellow marking; *wings* obovate, apex rounded and incurved to enclose the keel, deeply auriculate, 6.5–7.5 × 2.5–3 mm including the ca. 2 mm claw, dark red; *keel* half very broadly obovate, acute, auriculate, saccate, 5–6 × 2 mm including the 1.5–2 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 slightly longer, angular-terete filaments and shorter, versatile, round anthers with confluent thecae; outer whorl of 5 with slightly shorter, compressed filaments and longer, basifixed, oblong 2-celled anthers; filaments free. *Pod* obliquely shallowly

obtriangular, sharply beaked, very compressed, 15–18 × 9–11 mm, greyish; upper suture sigmoid; lower suture acute. *Seed* obloid, ca. 5 mm long, 3 mm broad, 2 mm thick, black; *aril* ca. 4 mm long. (Fig. 80).

**Common name:**—Prickly Bitter-pea.



**FIGURE 80.** *Daviesia horrida*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *N.T. Burbidge 2251*; B from *Crisp 6631*; C from *Clements 194a*. Drawn by A.L. Prowse.



**Flowering period:**—July to September. *Fruiting period:* September to December.

**Distribution:**—Western Australia, from Bindoon north of Perth, and the Darling Range, south to Busselton and east to the Pallinup River, east of Albany.

**Habitat:**—Grows on rocky hillsides or in sandy loam or sandy clay with gravel on undulating to hilly terrain, in mixed, open *Eucalyptus* forest with a dense, low shrub understorey.

**Selected specimens (80 examined):**—WESTERN AUSTRALIA. **Avon:** Upper Swan River, *Sewell, s.n.* (MEL 81287). **Darling:** Near 37 mile peg Perth to Albany Road, 32°22'S, 116°15'E, *N.T. Burbidge 2251*, 8 September 1947 (CANB); ca. 3 km N of Mt Barker (near the road to Cranbrook), 34°37'S, 117°40'E, *Hj. Eichler 16189*, 31 August 1959 (AD, CANB); Swanview, Darling River, 31°53'S, 116°03'E, *A. Morrison s.n.*, 17 November 1902 (CANB 336611, E); N slopes of Mt Angwin above scenic road, Porongorup Range, Porongorup National Park, 34°40'S, 117°51'E, *E.N.S. Jackson 3304*, 13 September 1977 (AD, CANB, PERTH); Canning Mills Road, Gosnells, 32°05'S, 116°00'E, *R.J. Cranfield 424*, 20 August 1978 (CANB, PERTH); Darling Range, near the Preston River, 1.5 km SE of Mumballup, S of Collie, 33°32'S, 116°07'E, *M.D. Crisp 1032*, 11 August 1975 (CBG, PERTH); Swan River, *A. Lea*, August 1898 (PERTH); Darling Range, 56 km N of Midland and 5 km S of Bindoon on Great Northern Highway, 31°25'S, 116°05'E, *M.D. Crisp 6631–2*, 21 July 1980, seedlings (CBG with some duplicates to AD, PERTH); Serpentine Falls, 32°22'S, 116°08'E, *J.W. Green 359*, 14 August 1955 (PERTH); Kalamunda, 31°58'S, 116°03'E, *R. & M. Hamilton 130*, 22 July 1985 (CANB, HO, MEL, PERTH). **Eyre:** Kamballup on rocky area, 34°35'S, 117°59'E, *M.A. Clements 194a*, 25 October 1975 (CBG); 2 km SW of Pallinup River crossing along Highway 1 towards Albany, 34°26'S, 118°45'E, *M.D. Crisp 5117*, 14 January 1979 (CBG, PERTH).

**Affinity:**—Leafy plants can resemble broad-leaved plants of *D. longifolia* but this species lacks the rigid, divaricating, spinescent, leafless upper branchlets of *D. horrida*. Leafless specimens may be confused with *D. divaricata*, which differs in having two rather than a single yellow marking on the standard. *Daviesia divaricata* also has generally fewer flowers (1–6) per inflorescence. *Daviesia horrida* is easily distinguished from *D. divaricata* subsp. *lanulosa* by the lack of woolly hairs around the inside of the calyx lobes.

**81. *Daviesia megacalyx*** Crisp (1995: 1209). Type [approximate locality data given because the species is rare]: Western Australia, Eyre, near Ravensthorpe, 33°40'S, 120°10'E, *M.D. Crisp 6065, J. Taylor & R. Jackson*, 22 September 1979. Holotype: CBG; isotypes: K, PERTH

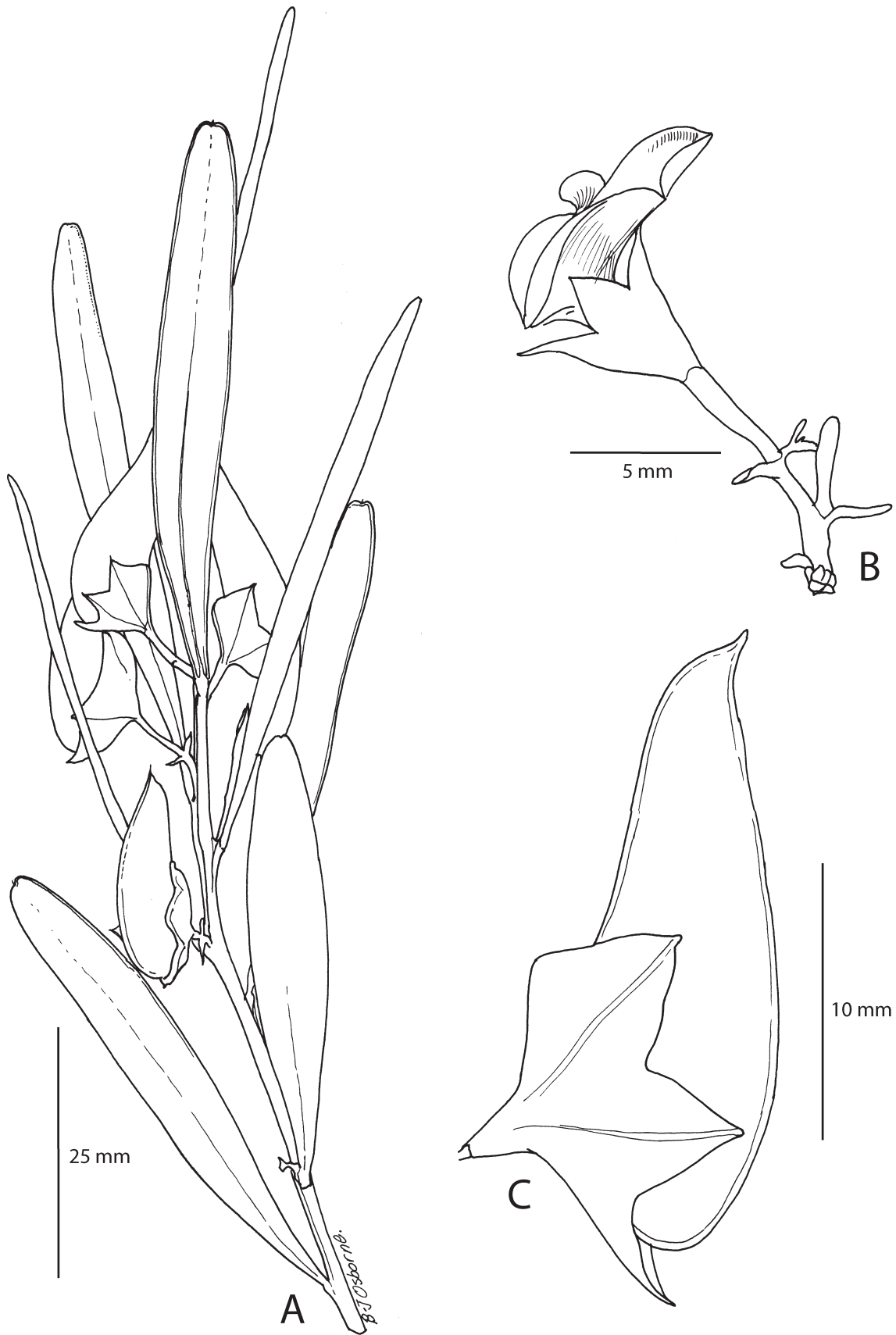
*Shrubs* to 1.5 m tall, glabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* erect, angular. *Phyllodes* scattered, erect, narrowly obovate or elliptic, apex apiculate, with a small mucro, rarely retuse, tapered to the articulate base, 40–80 × 5–12 mm, with a faint midrib and barely visible venation, coriaceous, green. *Unit inflorescences* 1 per axil, 1(2)-flowered; *peduncle* 1–2.5 mm long; *rachis* 0–2.5 mm long; *subtending bracts* spreading, oblong, ca. 3 mm long. *Pedicels* 3–6 mm long, much longer than the stipe-like receptacle. *Calyx* 3.5–5 mm long in flower including the 1.5 mm receptacle, in fruit enlarged 2-fold and thickened, persistent, black and conspicuous after fruit has fallen; lobes ± uniform, triangular, ca. 2.5 mm long. *Corolla: standard* very broadly ovate, slightly emarginate, ca. 11 × 12–14 mm including the 2.5 mm claw, apricot towards margins, maroon towards centre, with an intensely yellow central marking; *wings* broadly spatulate, strongly incurved and rounded at apex but scarcely overlapping, auriculate, ca. 8.5 × 5–5.5 mm including the 2 mm claw, deep pink; *keel* half elliptic, acuminate, inflated, auriculate, saccate, ca. 6.5 × 2.5 mm including the 2.5 mm claw, deep pink. *Stamens* strongly dimorphic: inner whorl of 5 with slender, terete filaments and shorter, round anthers with confluent thecae; outer whorl of 5 with broader, compressed filaments and longer, oblong, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, compressed, 20–23 × 9–11 mm, pericarp coriaceous; upper suture sigmoid; lower suture strongly acute. *Seed* obloid, ca. 5 mm long, 3 mm broad, 2 mm thick, light brown with no mottling; *aril* 2.5 mm long. (Fig. 81).

**Flowering period:**—August and September. *Fruiting period:* August to October.

**Distribution:**—Western Australia, restricted to the Ravensthorpe area.

**Habitat:**—Gravelly laterite or red clay with ironstone gravel in mallee-heath or dense shrubland, dominated by *Eucalyptus preissiana* Schauer (1844: 131), *E. pleurocarpa* and *E. falcata* (1847: 163) *s.l.*

**Conservation status:**—National: Endangered. WA: Critically Endangered, Declared Rare Flora.



**FIGURE 81.** *Daviesia megacalyx*. A. Fruiting branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6065* (type); C from *Newbey 569*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Additional specimens examined:**—Approximate locality data are given because the species is rare. **WESTERN AUSTRALIA. Eyre:** near Ravensthorpe, 33°40'S, 120°10'E, *M.D. Crisp 4956*, 9 January 1979 (CBG, MEL, MO, NSW, PERTH); *ibid.*, *K. Newbey 569*, 21 October 1962 (PERTH); *ibid.*, *A.S. George 5773*, 31 August 1963 (CANB, PERTH); *ibid.*, *C.E. & D.T. Woolcock D254*, 18 September 1982 (CBG); *ibid.*, *M.D. Crisp 8986 & W. Keys*, 21 October 1996 (CBG, PERTH).

**Affinity:**—The peculiar calyx, for which *D. megacalyx* is named, sets it apart from all other species in the genus except *D. obovata*. In both these species the calyx increases to twice its size from flower to fruit, hardening and turning black in the process. After the pods have dehisced and fallen, these old black calyces persist on the plant for a considerable period, giving the appearance of fruits from a distance. Despite this, these two species differ in several characters. *Daviesia obovata* may be distinguished by its much broader phyllodes (18–45 mm), by its glaucous foliage, by its larger, 2–3-flowered racemes, and by its longer flowering calyx (7–8 mm).

**82. *Daviesia obovata*** Turczaninow (1853: 261), Bentham (1864: 77), Crisp (1995: 1217). Type: 'Drum. V. n. 41.' Holotype: KW; isotypes: E, FI-W, G (2 sheets), K (3 sheets), MEL, OXF, P, W

Slender, erect *shrubs*, to 1.5 m high, glabrous, glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* erect, terete, becoming angular towards the apex, longitudinally wrinkled when dry. *Phyllodes* scattered, erect, obovate, apically rounded and ± retuse, base constricted and petiole-like, obscurely articulate, (40–)55–90 × (8–)18–45 mm, venation prominent and reticulate when dry, thick and fleshy when fresh, wrinkled when dry. *Unit inflorescences* 1 per axil, racemose, 2–3-flowered; *peduncle* 2.5–7 mm long; *rachis* 5–7 mm long, ending in a sterile bristle ca. 3 mm long with *barren bracts* at the apex; *subtending bracts* spreading, ± oblong, cupped, ca. 4 mm long. *Pedicel* 3–4 mm long. *Calyx* 7–8 mm long in flower including the 1.5–2.5 mm receptacle, in fruit enlarged 2-fold and thickened, persistent black and conspicuous after fruit has fallen; lobes ± equal, upper 2 lobes united higher than the lower 3, ca. 2.5 mm long. *Corolla: standard* depressed-ovate, emarginate, 9.5–11 × 14.5–16 mm including the ca. 3 mm claw, yellow with a pale green ring around the yellow centre; *wings* obovate, apex rounded and incurved to enclose the top of the keel, auriculate, 9–10.5 × 3.5–4 mm including the ca. 2.5 mm claw, pale yellow-green, becoming pale, yellow-maroon towards the apex; *keel* half depressed-obovate, scarcely acute, auriculate, 7.5–9 × 3–3.5 mm including the 2–2.5 mm claw, pale yellow-green. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely very broadly to shallowly obtriangular, acute, compressed, 8.5–23 × 8.5–10 mm, abaxial margin bent through 180°, giving the pod an almost oblong appearance; upper suture sigmoid or deeply undulating; lower suture strongly acute. *Seed* fusiform, ca. 5 mm long, 2–2.5 mm broad, 1.5–2 mm thick, light brown with black mottling, no mottling when immature; *aril* ca. 3.5 mm long. (Fig. 82).

**Flowering period:**—October. *Fruiting period:* Beginning in October.

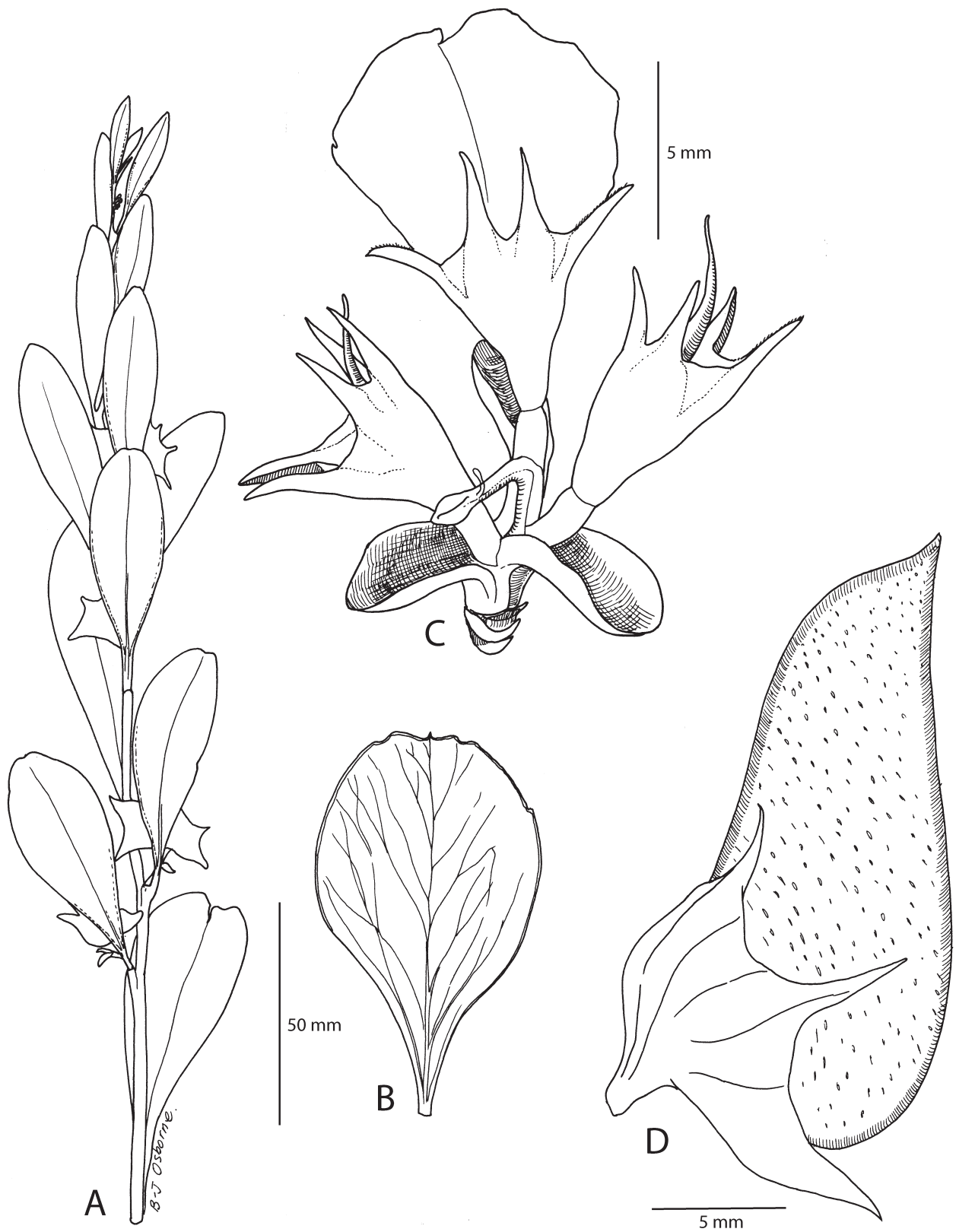
**Distribution:**—Western Australia, restricted to two disjunct areas in the eastern Stirling Range and the Barrens.

**Habitat:**—Grows on meta-sandstone outcrops at moderate elevation (500–800 m) in heath dominated by *Eucalyptus marginata* or in pink-grey sandy loam with diverse shrubs including species of *Allocasuarina*, *Proteaceae* and *Acacia*.

**Conservation status:**—National: Endangered. WA: Endangered, Declared Rare Flora.

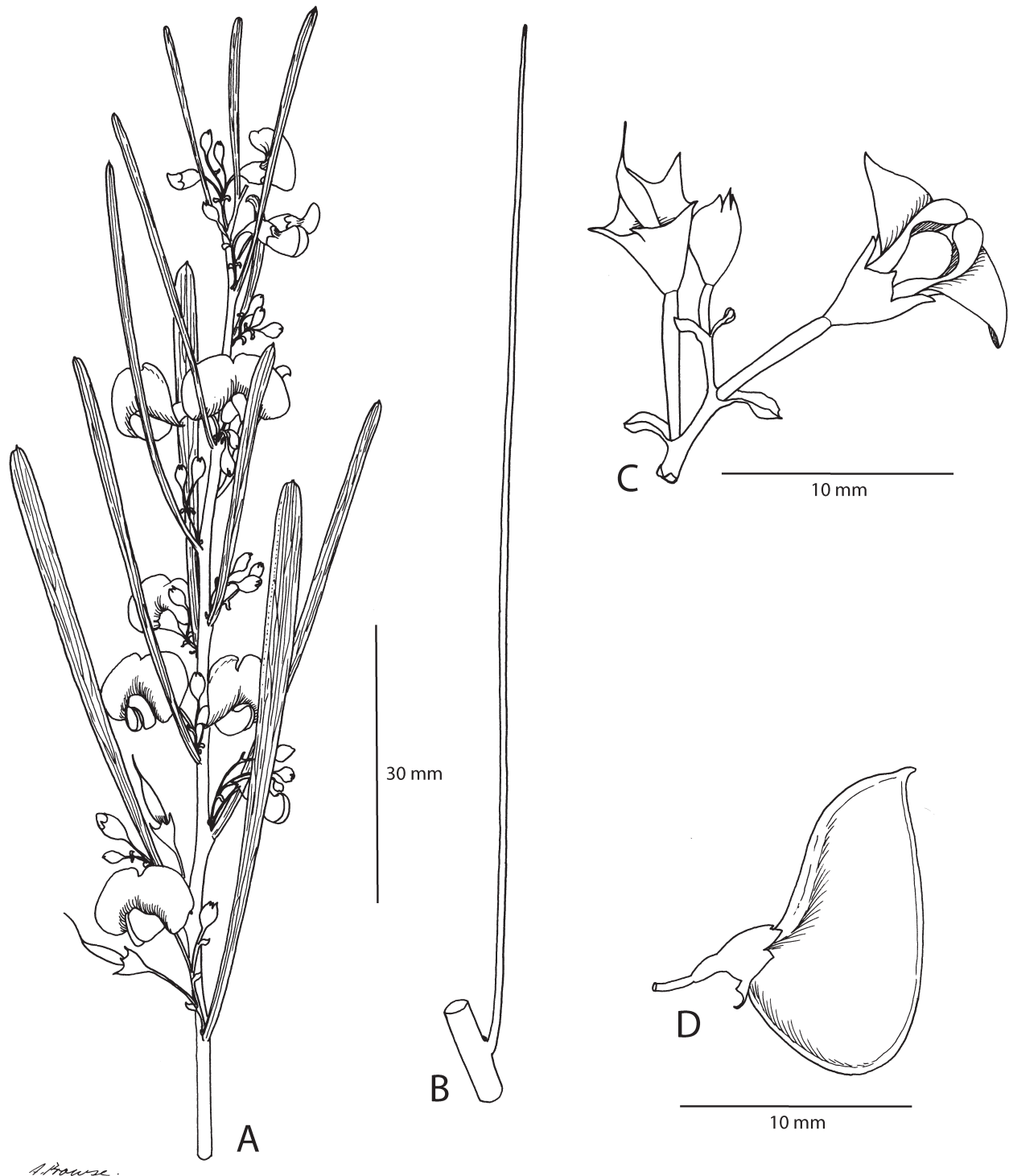
**Additional specimens examined:**—Approximate locality data are given because the species is rare. **WESTERN AUSTRALIA. Eyre:** Eastern Stirling Range, 34°20'S, 118°20'E, *M.D. Crisp 8948 & W. Keys*, 15 October 1996 (CBG, PERTH); *ibid.*, *S.D. Hopper 2332*, 7 May 1982 (CANB, PERTH); *ibid.*, *A. Morrison 12607*, 18 October 1902 (AD, K, MEL, PERTH); *ibid.*, *J.S. Beard 7654*, 4 October 1975 (NSW, PERTH); *ibid.*, *A.S. George 10419*, 11 October 1970 (PERTH); *ibid.*, *M.D. Crisp 5289*, 19 January 1979 (CBG, K, MEL, PERTH).

**Affinity:**—The peculiar calyx sets this species apart from all others in the genus except *D. megacalyx*. In both these species the calyx increases to twice its size from flower to fruit, hardening and turning black in the process. After the pods have dehisced and fallen, these old black calyces remain on the plant for a considerable period, giving the appearance of fruits from a distance. *Daviesia megacalyx* may be distinguished by its non-glaucous, much narrower phyllodes (5–12 mm broad), which are narrowly obovate or narrowly elliptic in outline, by the smaller, 1(2)-flowered racemes; and by the shorter flowering calyces (3.5–5 mm long).



**FIGURE 82.** *Daviesia obovata*. A. Branchlet with persistent enlarged post-fruiting calyces. B. Lower phyllode, adaxial view. C. Inflorescence. D. Pod. A, B, D from *Crisp 5289*; C from *George 10419*. Drawn by B.-J. Osborne.

**83. *Daviesia rubiginosa*** Crisp (1995: 1230). Type: Western Australia, Roe, 19 km E of Peak Charles, 32°46'S, 121°17'E, *M.D. Crisp 5992*, *J. Taylor & R. Jackson*, 20 September 1979. Holotype: CBG; isotypes: K, L, MEL, NSW, PERTH. Paratypes: Western Australia, Coolgardie District, 2 km NE of Mt Hampton, 31°55'S, 119°05'E, *M.D. Crisp 5564*, 29 January 1979 (CBG, MEL, NSW, PERTH); Yellowdine, c. 32 km E of Southern Cross, *Paul G. Wilson 3527*, 23 September 1964 (AD, PERTH)



**FIGURE 83.** *Daviesia rubiginosa*. A. Flowering branchlet with flat phyllodes. B. Terete phyllode. C. Inflorescence. D. Pod. A, C from *Crisp 5992* (type); B, D from *Demarz 7181*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Broom-like *shrubs*, to 2 m tall, glabrous to glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* erect, terete, lightly pruinose, becoming reddish or purplish with age. *Phyllodes* scattered, erect, linear to terete, mucronate, when linear obtuse or truncate at apex and attenuated to the obscurely articulate base, 30–250 mm or longer, 0.5–1 mm diam. when terete, to 4 mm broad when linear, smooth when fresh or with numerous longitudinal veins when dry that anastomose in linear phyllodes, glaucous. *Seedling phyllodes* obovate, retuse, tapering to base, 55–130 × 6–13 mm, glaucous. *Unit inflorescences* 1(2) per axil, racemose, 2–4-flowered; *peduncle* ca. 1 mm long; *rachis* 1–8 mm long; *subtending bracts* spreading widely, spatulate, 2–2.5 mm long, caducous leaving a rim at pedicel base. *Pedicel* 3–5.5 mm long. *Calyx* 4–4.5 mm long including the ca. 1 mm receptacle; lobes ± equal, gently recurved, acuminate, each with a central rib. *Corolla: standard* transversely elliptic, emarginate, 6–7 × 8–9 mm including the 1.5–2 mm claw, with 2 calli at the base of the lamina, orange-yellow with a large red ring surrounding the bright yellow centre; *wings* spatulate, rounded and incurved at apex to enclose the keel, ca. 6 × 3 mm including the 2 mm claw, bright red; *keel* acute, abaxially rugose, 5 × 2 mm including the 1.5 mm claw, very pale pink (almost white). *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free; vexillary stamen with filament channelled, embracing gynoecium, dilated upwards. *Pod* obliquely shallowly obtriangular, acuminate, pungent, compressed, 10–12 × 6–7 mm, red-brown; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 83).

**Flowering period:**—August to October. *Fruiting period:* October and November.

**Distribution:**—Western Australia, eastern fringes of the wheatbelt (and beyond), from Chiddarcooping Hill south-east to the Mt Buraminy area, east of Esperance.

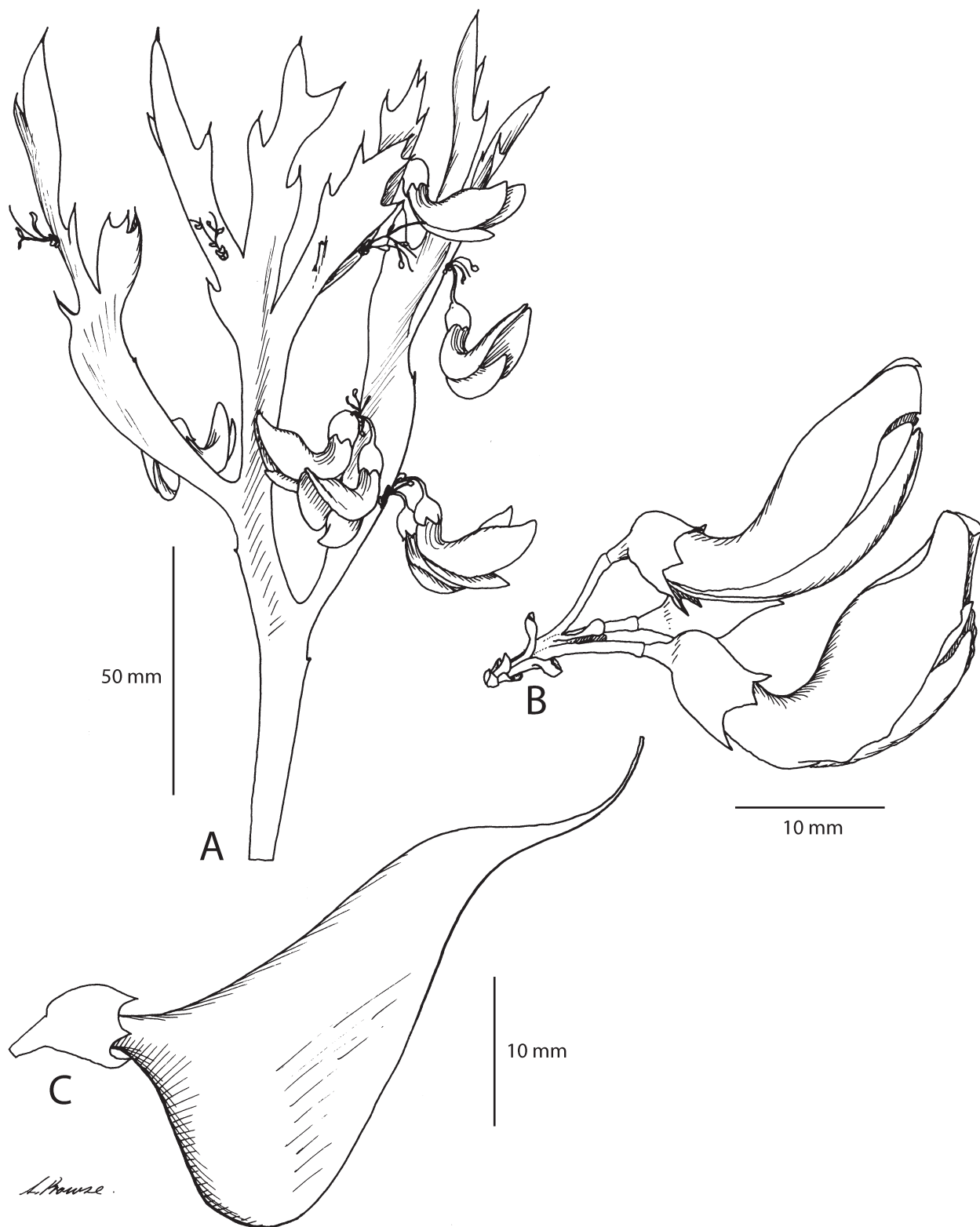
**Habitat:**—Yellowish clayey granitic sand, sometimes with gravel, or sandy loam over granite or ironstone in heath commonly dominated by *Allocasuarina campestris* (Diels 1904: 126) Johnson (1982: 74) and broombush species of *Melaleuca*.

**Selected specimens (15 examined):**—**WESTERN AUSTRALIA. Avon:** Ca. 65 km SSW of Southern Cross, 2 km NE of Mt Hampton, 31°55'S, 119°05'E, *M.D. Crisp 5564*, 29 January 1979 (CBG, MEL, NSW, PERTH); Holleton, near Merredin, 31°57'S, 119°01'E, *A.W. Miller (per J.A.C. Smith) s.n.*, 30 October 1973 (PERTH 5212200). **Coolgardie:** Yellowdine, 31°18'S, 119°39'E, *P. Wilson 3527*, 24 September 1964 (AD, PERTH); *ibid.*, *H. Demarz 7181*, 14 November 1978 (PERTH). **Roë:** 19 km NE of Peak Charles along road to Norseman, 32°46'S, 121°17'E, *M.D. Crisp 5993, et al.*, 20 September 1979 (CBG, NSW, PERTH); NW slopes of Mt Ironcap, 32°21'S, 119°40'E, *P.S. Short 1702*, 12 September 1982 (MEL); Holt Rock, 32°41'S, 119°25'E, *M.D. Crisp 9001 & W. Keys*, 22 October 1997 (CBG, PERTH).

**Affinity:**—*Daviesia horrida* is probably the closest relative of *D. rubiginosa* (Fig. 1B). These species are very similar in all reproductive parts, as well as in the unusual anastomosing venation. Also, both have strikingly different ontogenetic stages in their vegetative morphology. In *D. horrida* the phyllodes are reduced to scales in the upper branchlets, whereas the upper phyllodes of *D. rubiginosa* become terete but remain elongate. *Daviesia horrida* may be distinguished readily by its rigid, divaricating, spinescent branchlets, acute phyllode apex, larger racemes (rachis 2–20 mm long, flowers 3–10) and persistent bracts.

**Variation:**—*Daviesia rubiginosa* is an odd species, with apparently plastic phyllodes, varying even on a single plant. This is the reason that papatypes were designated. It appears that the linear phyllodes may represent an earlier ontogenetic stage and terete phyllodes a later stage. Nevertheless, plants with entirely linear phyllodes are fully fertile, perhaps a result of heterochrony. An alternative explanation may be that linear phyllodes are an adaptation to xeric habitats—specimens from more inland, drier sites (e.g. *Crisp 5564*, *Wilson 3527*) have mostly terete phyllodes. However, plants seen from such sites were also larger, and therefore probably older at the time of collection, than plants collected nearer the coast (such as the holotype).

**84. *Daviesia epiphyllum*** Meisner (1855: 27), Bentham (1864: 87, '*epiphylla*'), Crisp (1995: 1192). Type: 'Drumm. Coll. VI. n. 18.' Holotype: NY (mistakenly annotated '?isotypes' by Crisp); isotypes: BM, CGE, G, K (2 sheets), LD, MEL, OXF, W. Note: The spelling of the epithet used here (*epiphyllum*) is as published originally, which is orthographically correct, meaning 'upon the leaf'. Presumably, this refers to the insertion of the inflorescences on the lamina of the flattened phylloclade. Grammatically, the epithet is a noun in apposition to the generic name, with which it does not have to agree. Bentham incorrectly altered the spelling to '*epiphylla*' and subsequent authors followed him



**FIGURE 84.** *Daviesia epiphyllum*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from Chapman (26B)77; B from Chapman (4), 27 Apr. 1979; C from Gardner 9400. Drawn by A.L. Prowse.

Broad *shrubs* ca. 0.5–1.5 m high, very rigid, glabrous, pruinose. *Root anatomy* with late-developing anomalous secondary thickening (cord type). *Branchlets* modified into flattened phylloclades, ca. 5–20 mm broad, with a ‘staghorn’ branching pattern, terminating in robust spines; phylloclade surfaces wrinkled when dry. *Phyllodes* present on upper phylloclades as oblong-triangular lobes, cuspidate, robustly pungent, 3–12 mm long and 3–8 mm

wide at base; phyllodes reducing to minute (ca. 1 mm) scales on the face and margins of lower phylloclades, narrowly triangular, acute. *Unit inflorescences* solitary in scale-leaf axils (occasionally in phyllode axils), condensed-racemose, 3–7-flowered; *peduncle* 1–2 mm long; *rachis* 2–4 mm long; *barren basal bracts* numerous, forming an involucre, 1–2 mm long; *subtending bracts* elliptic, recurved to partially enclose immature pedicel, ca. 5 mm long. *Pedicels* decurrent with rachis, 4–10 mm long. *Calyx* 9–10 mm long including the 2–3 mm receptacle; upper 2 lobes united in a truncate lip, ca. 1.5 mm long; lower 3 lobes narrowly triangular, ca. 1.5 mm long. *Corolla: standard* broadly elliptic, remaining partly folded longitudinally, deeply emarginate, 23–25 × 16–18 mm including the 2–3 mm claw, watery yellow-red with a yellow centre inside and watery red outside; *wings* narrowly elliptic, apically rounded but neither incurved nor overlapping, deeply auriculate, 23–29 × 4.5–5.5 mm including the ca. 3 mm claw, watery red; *keel* half transversely ovate, acute, auriculate, 24–26 × 5–6 mm including the 2–3 mm claw, watery red. *Stamens* strongly dimorphic: inner whorl of 5 with much longer, slender, terete filaments and round, versatile anthers with confluent thecae that are ca. half the size of the outer anthers; outer whorl of 5 with much shorter, broader, compressed filaments thickened at the base and longer, 2-celled, basifixed anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, compressed, 25–35 × 14–17 mm; upper suture sigmoid; lower suture acute. *Seed* 3–4 mm long, 2.2–3 mm wide, 1–1.5 mm thick; *aril* ca. 2 mm long. (Fig. 84).

**Common name:**—Staghorn Bush.

**Flowering period:**—April to June. *Fruiting period:* June to September.

**Distribution:**—Western Australia, sandplains north of Perth from 50 km N of Bullsbrook to Eneabba and inland as far as the Moora vicinity.

**Habitat:**—Grows in sand or gravelly sand on sandplains in heathland often dominated by *Eucalyptus pleurocarpa* s.l. or *E. macrocarpa* Hooker (1841: t. 405).

**Selected specimens (21 examined):**—**WESTERN AUSTRALIA.** **Irwin:** 2 km E of the Brand Highway on the Coorow–Green Head road, 30°06'S, 115°20'E, *C. Chapman* (67)77, 25 August 1977 (CBG); 88.7 km from Three Springs, 29°53'S, 115°13'E, *C. Chapman* (26B)77, 19 June 1977 (CBG, MEL); W of Dinner Hill, 30°20'S, 115°36'E, *A.S. George* 2345, 25 April 1961 (PERTH); Mt Peron, 30°07'S, 115°09'E, *C.A. Gardner* 9400, 26 August 1949 (PERTH).

**Affinity:**—This species is difficult to confuse with any other in the genus because of the distinctive cladodes and large flowers. Nevertheless, both the molecular phylogeny (clade VII.d, Fig. 1B) and morphological synapomorphies show clearly that *D. speciosa* is the sister species of *D. epiphyllum*. Unique characters shared by these species include nearly identical red bird-pollinated flowers that are much larger than any others in the genus, as well as the vegetative habit, in which plants have a non-reproductive 'crown of thorns' with terminating growth. Inflorescences and new shoots emerge lower on the stems, from nodes subtended by scale-leaves. However, these species are easily distinguished by the terete branchlets and phyllodes of *D. speciosa* versus the broad, flat phylloclades of *D. epiphyllum*.

**Note on morphology:**—The terminal vegetative lobes of *D. epiphyllum* are so broadly decurrent and continuous with the phylloclades as to be nearly indistinguishable from them. Nevertheless, we have interpreted these lobes as phyllodes, partly because they are positionally equivalent, and thus likely homologous, to the fully developed phyllodes of *D. speciosa*. Moreover, like the terete phyllodes of *D. speciosa*, they lack nodes or subtending scale-leaves and are replaced by scale-leaves lower on the stems. Moreover, the occasional presence of an inflorescence in the axil of a near-terminal spine of *D. speciosa*, and of a lobe in *D. epiphyllum*, supports the phyllode hypothesis for these structures. To resolve the homology of these structures in the two species will require detailed anatomical and developmental analysis.

**85. *Daviesia speciosa*** Crisp (1995: 1237). Type [approximate locality data given because the species is rare]: Western Australia, Irwin, Eneabba area, 29°50'S, 115°30'E, *C. Chapman* s.n., 8 April 1980. Holotype: CBG 8002488; isotypes: AD, BRI, CANB, K, L, MEL, MO, NSW, PERTH, US

Low *shrubs* with multiple stems ascending (or resprouting) from a woody rootstock, 0.3–0.8 m high and up to 1 m wide, glabrous, pruinose. *Root anatomy* with anomalous secondary thickening (cord type). Shoots terminated by a crown of phyllodes that abruptly reduce to scale leaves on lower parts of stems; *branchlets* terete, robust (2.5 mm diam.), with a pithy core, smooth when fresh, striate with wrinkled anastomosing veins when dry. *Phyllodes* erect, continuous with the branchlets and distinguishable from them only because the latter are subtended by phyllodes or





**FIGURE 85.** *Daviesia speciosa*. A. Flowering branchlet. B. Inflorescence. A, B from Chapman s.n. (CBG 8002488; type). Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

scale-leaves, gently incurved, terete, rigid, apically acicular, robustly pungent, 15–80 mm long, ca. 2 mm diam.; scale-leaves black, subulate, 1–2 mm long. *Juvenile phyllodes* horizontally compressed, thick, linear. *Unit inflorescences* mostly subtended by scale-leaves below the crown of fully developed phyllodes, 1 per axil, condensed-racemose, 1(2)-flowered; *peduncle* 3–4 mm long; *rachis* 2–6 mm long; *barren basal bracts* imbricate, ovate, striate, 2–3 mm long; *subtending bracts* spreading, linear-spathulate, with margins incurved, striate, 8–10

mm long, red inside, pruinose outside. *Pedicels* filiform, difficult to distinguish from the stipe-like receptacle, 5–15 mm long. *Flowers* nodding, 22–25 mm long. *Calyx* ventricose, 8–11 mm long including the 3–4 mm receptacle; lobes nearly equal, acuminate, ca. 2 mm long, pruinose. *Corolla* red; *standard* ovate, entire, reflexing only 45–60°, remaining folded longitudinally and with margins incurved, thus appearing narrow, acute, tapered to base, deeply channelled at the base, ca. 20–23 × 15–17 mm including the 2–3 mm claw; *wings* narrowly ovate, acute, with apices incurved to expose the keel, giving the appearance of being beaked, not overlapping, auriculate, saccate, ca. 20–22 × 4.5–5 mm including the 2 mm claw; *keel* half ovate, falciform, acute, auriculate, ca. 23–25 × 5.5 mm including the 2.5–3.5 mm claw. *Stamens* weakly dimorphic: anthers all 2-celled; inner whorl of 5 with distinctly longer filaments and subdorsifixed, shorter anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; filaments free, sigmoid and strongly compressed at base, becoming terete distally. *Pod* apparently never set. (Fig. 85).

**Flowering period:**—April and May. *Fruiting period:* Unknown.

**Distribution:**—Western Australia, Irwin, between Eneabba and Mingenew.

**Habitat:**—Gravelly soils in heath dominated by multiple species of *Melaleuca*, with *Banksia* and emergent *Eucalyptus gittinsii*.

**Conservation status:**—National: Endangered. WA: Endangered, Declared Rare Flora.

**Selected specimens (12 examined):**—Approximate locality data are given because the species is rare.

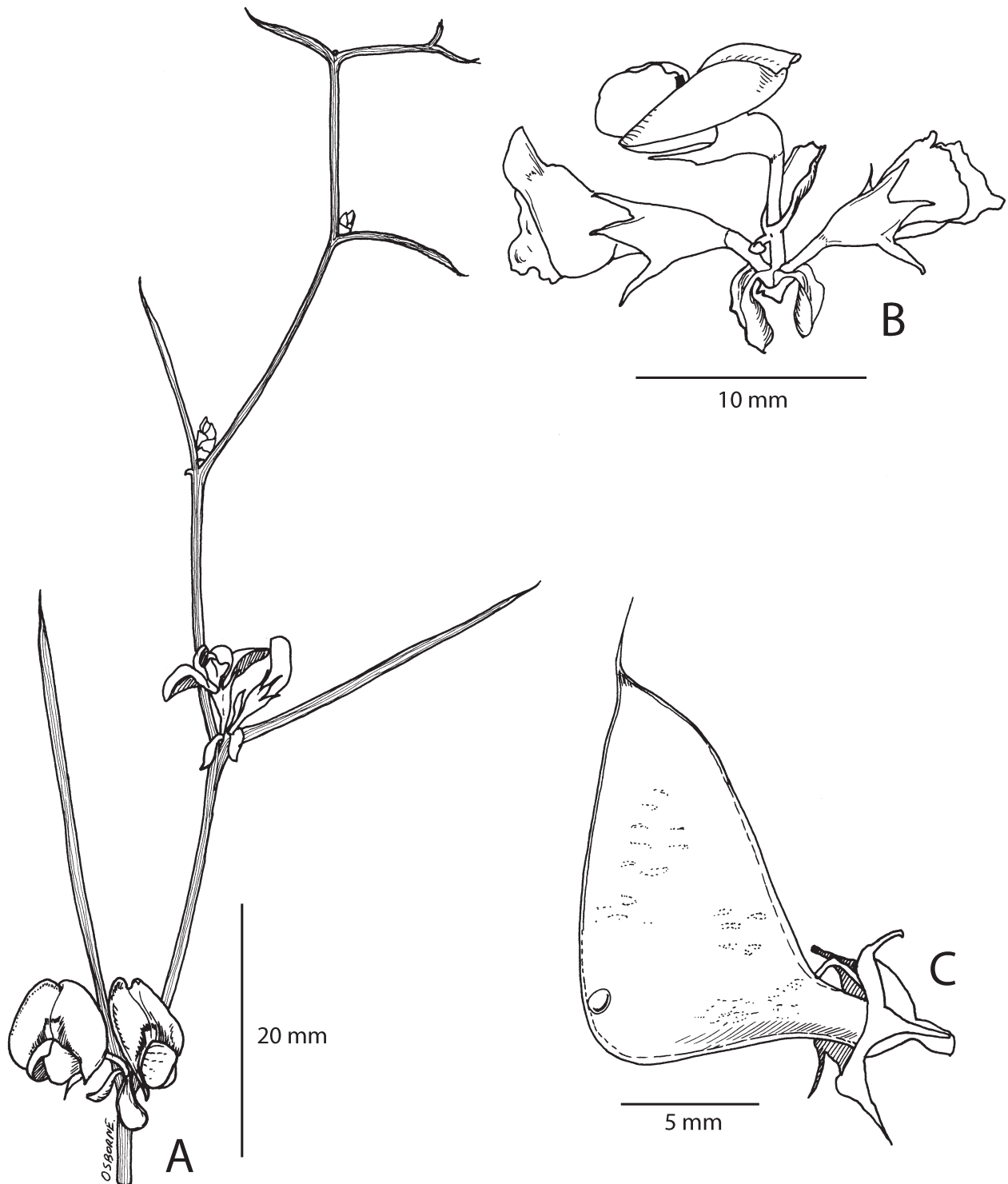
**WESTERN AUSTRALIA. Irwin:** Near Mingenew, 29°10'S, 115°30'E, *C.A. Gardner s.n.*, September 1958 (PERTH 5475694); W of Winchester, 29°50'S, 115°30'E, *C. Chapman (3)76*, 7 May 1976 (CBG, MO, NSW, PERTH); *ibid.*, *C. Chapman s.n.*, June 1979 (CBG 7906517); S of Mingenew, 29°20'S, 115°30'E, *M.D. Crisp 10856*, 24 September 2010 (CANB, PERTH).

**Affinity:**—*Daviesia speciosa* is one of the most bizarre species in the genus, and could not be confused with any other. Even though the flowers are modified and enlarged (presumably for bird-pollination, Crisp 1994, Toon *et al.* 2014), and despite the absence of pods, which are a diagnostic feature of the genus, this is clearly a *Daviesia*, as evidenced by the vegetative morphology and inflorescence structure. Only *D. cunderdin* and *D. epiphyllum* have similar, enlarged red flowers, apparently modified for specialised bird-pollination. *Daviesia epiphyllum* is the sister species of *D. speciosa* (clade VII.d, Fig. 1B) but may be readily distinguished by its flattened phylloclades with all phyllodes apparently reduced to scales, and smaller bracts (ca. 2 mm long), as well as subtle differences in the floral structure. *Daviesia cunderdin* can be easily distinguished by its elliptic to ovate phyllodes, the 1-flowered inflorescences and the smaller flowers (e.g. standard 12–15 mm long), with large, prominent calli on the standard-petal.

**86. *Daviesia major*** (Benth.) Crisp (1995: 1208), Wheeler *et al.* (2002: 747). *Daviesia hakeoides* Meisner (1844: 47) var. *major* Bentham (1864: 83). Type: 'Granite hills north from Cape Paisley, Maxwell.' Holotype: MEL 78890

Bushy, intricate or diffuse and spreading, multi-stemmed *shrubs*, to 0.7 m high and 1 m broad, glabrous. *Root anatomy* unknown. *Branchlets* flexuose, terete, smooth when fresh, finely striate when dry. *Phyllodes* widely scattered, ± divaricate and recurving at tips, terete, acicular, pungent, inarticulate at base, continuous with and closely resembling the branchlet, 0–200 mm long, 0.8–1.5 mm diam., decreasing considerably in length towards branchlet apex. *Unit inflorescences* single in upper axils, racemose, 1–3-flowered; rachis and peduncle very short and obscured by bracts, except ca. 2 mm terminal portion subtending an aborting bud; *peduncle* ca. 1 mm long; *rachis* < 2 mm long; *barren basal bracts* several, imbricate, to 3 mm long; *subtending bracts* reflexed, obtusulate, cupped, striate, 4–5 mm long. *Pedicels* 1–3 mm long. *Calyx* campanulate, 5–6 mm long including the ca. 1 mm receptacle, lead grey with a pale stripe along each lobe and a pale patch in each sinus; lobes subequal, acuminate; upper 2 lobes ca. 1.5 mm long; lower 3 lobes ca. 2 mm long. *Corolla: standard* depressed-ovate, emarginate, reflexed > 90°, truncate at base, ca. 9 × 11–12 mm including the 2 mm claw, orange with red infusion towards centre and an intensely yellow mark at centre; *wings* broadly spatulate, very rounded and incurved at apex, auriculate, ca. 8 × 5 mm including 1 mm claw, dark red or with orange tips; *keel* lunate, acute, auriculate, saccate, ca. 5 × 2 mm including 1 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with terete filaments and versatile anthers with confluent thecae; outer whorl of 5 with slightly shorter, compressed filaments and basifixed, 2-celled anthers; filaments free; vexillary filament dilated near apex. *Pod* obliquely shallowly obtriangular, acute, strongly compressed, 12–14 × 8–10 mm, viscid (fresh pods often have adhering sand grains),

red-brown; upper suture sigmoid; lower suture acute and sharply curved. *Seed* oblong-ellipsoid, ca. 3.5 mm long, ca. 2.25 mm broad, ca. 1.5 mm thick, light red-brown with faint mottling; *aril* oblong with a thick lobe below the hilum, pale brown. (Fig. 86).



**FIGURE 86.** *Daviesia major*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *R. Borough 4*; B from *Crisp 6026*; C from *Crisp 6041*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Flowering period:**—(July) August to October. **Fruiting period:** September and October.

**Distribution:**—Scattered along the south coast of Western Australia from Busselton to Israelite Bay, but most collections are from east of Esperance. There appears to be a large disjunction between Hopetoun and Busselton.

**Habitat:**—All collections come from sandy sites, usually deep grey or white sand over granite, but near Busselton the sand overlies laterite, in heath with emergent eucalypts, *Banksia speciosa* and *Xanthorrhoea* Sol. ex Smith (1798: 219).

**Conservation status:**—Not currently of concern, especially as the species appears to be well-represented in the Cape Arid and Cape Le Grand National Parks. However, the distantly disjunct population near Busselton merits special attention.

**Additional specimens examined:**—**WESTERN AUSTRALIA. Darling:** 3 km along Ruabon Road, Busselton, 33°40'S, 115°30'E, *M. Carter 515*, 26 October 1985 (CANB, PERTH). **Eyre:** Lucky Bay, E of Esperance, 34°00'S, 122°14'E, *E.M. Bennett 851*, 10 September 1966 (NSW, PERTH); Cape Arid National Park, 7 km SW of Israelite Hill, 33°39'S, 123°47'E, *R. Borough 4*, 2 September 1978 (CBG, PERTH); Cape Arid National Park, near the foot of Mt Baring, 33°45'S, 123°16'E, *R. Borough 7*, 2 September 1978 (CBG, MO, PERTH); 3 km W of Israelite Bay ruins, 33°37'S, 123°50'E, *M.D. Crisp 4881*, 7 January 1979 (CBG); ca. 100 km NE of Ravensthorpe, 2.5 km S of Welcome Soak, 33°03'S, 120°50'E, *M.D. Crisp 6026 et al.*, 21 September 1979 (CBG, K, MEL, NSW, PERTH); 75 km NE of Ravensthorpe, 4 km W of Dunn Swamp, 33°10'S, 120°40'E, *M.D. Crisp 6041, et al.*, 21 September 1979 (CBG, PERTH); ca. 300 m up Thistle Cove trail from Lucky Bay end, 34°00'S, 122°13'E, *I. Solomon 391*, 2 August 1990 (CANB, PERTH); Cape Le Grand, 34°02'S, 122°07'E, *P.G. Wilson 5616*, 8 October 1966 (PERTH); Esperance, *C.E. Woolcock D72*, 1 August 1981 (CBG); Hopetoun, 33°57'S, 120°07'E, *C.E. Woolcock D75*, 1 August 1981 (CBG).

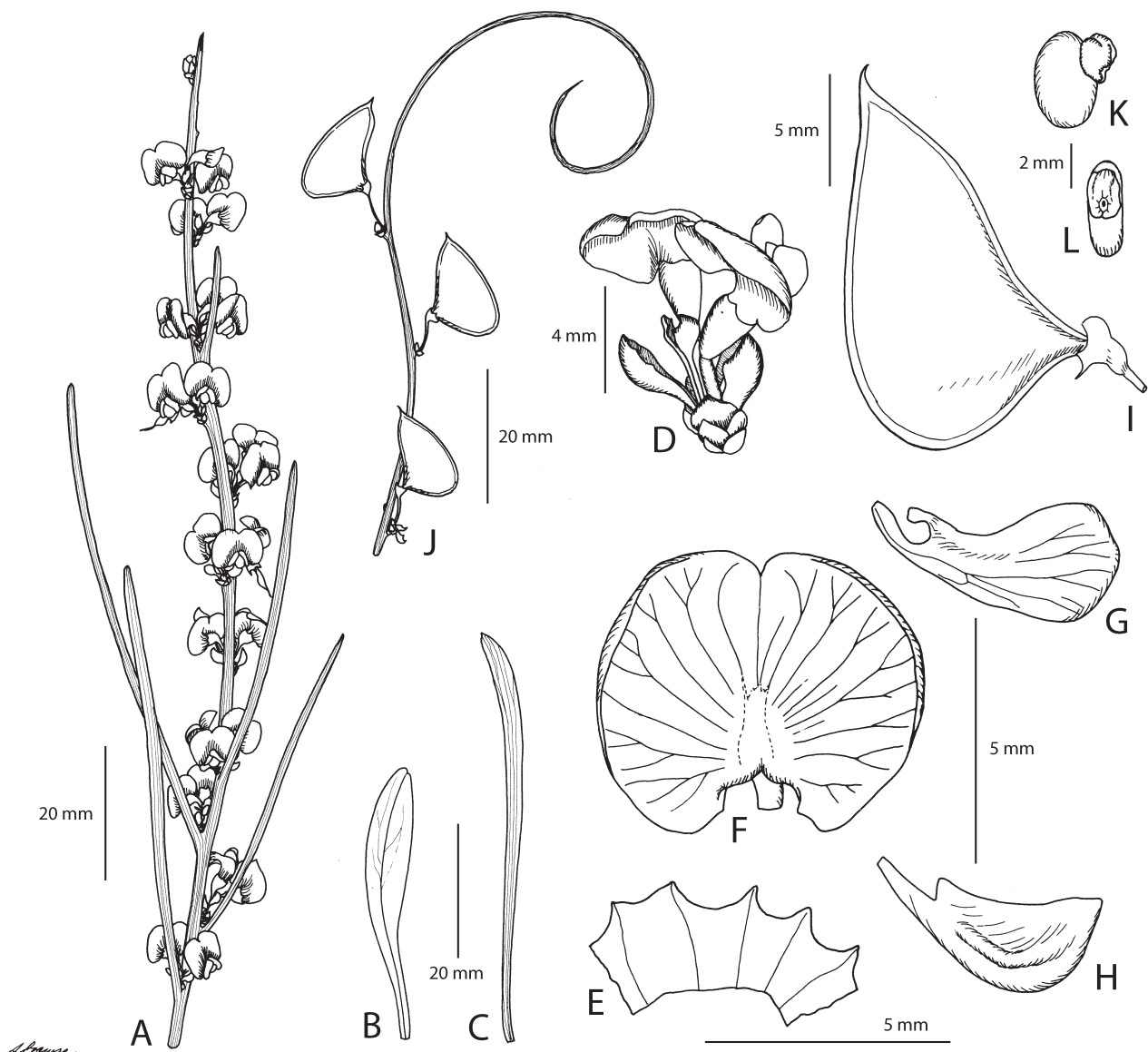
**Affinity:**—*Daviesia major* belongs to a natural group of species with moderately enlarged, shell-shaped, usually striate bracts which are imbricate and cover the rachis (Crisp 1982a; 1984). Within this group, it appears related to *D. hakeoides*, *D. debilior*, *D. pseudophylla* and *D. sarissa*. It differs from these in having reflexed subtending bracts, 4–5 mm long; calyx-lobes acuminate, each with a pale stripe; standard 11–12 mm broad; pod 12–14 mm long, viscid. By contrast, these species (except *D. sarissa*) have ascending or spreading subtending bracts which are up to 3 mm long, a calyx with lobes which lack stripes and with the upper 2 more or less united into a lip, a standard < 10 mm broad, and a pod which is usually smaller (except in *D. pseudophylla*) and never viscid.

The bracts and calyx of *D. sarissa* are similar to those of *D. major*, but *D. sarissa* may be distinguished by its smaller standard (5–6 mm broad), spreading (not reflexed) subtending bracts and smaller (7–8 mm long), bluntly beaked, non-viscid pod.

**87. *Daviesia debilior*** Crisp (1982a: 11), (Crisp 1987a: 249), Crisp (1995: 1185). Type [approximate locality data given because the species is rare]: SW of Eneabba, 30°S, 115°10'E, 19 June 1977, *C. Chapman (21 B)77*, fl. Holotype: CBG; isotypes: K, PERTH

*Shrubs* with procumbent stems and many weakly ascending branchlets, to 0.6 m tall and to 1.5 m broad, glabrous, occasionally glaucescent. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* weakly ascending, angular, prominently ribbed, even when fresh. *Phyllodes* scattered, reduced to minute scales at upper few nodes or over the entire plant, ascending, angular or compressed, linear, apically acute and mucronate, inarticulate, decurrent and difficult to distinguish from branchlets, 0–120 × 0.4–2 mm, with several prominent ribs. *Intermediate phyllodes* longer and narrower than juveniles, usually present at base of mature plants. *Juvenile phyllodes* flat but thick, narrowly spatulate, 20–50 × 4–8 mm, with midrib, thickened margins and many ascending anastomosing raised veins. *Stipules* minute or absent. *Unit inflorescences* 1 per axil, modified, condensed racemes, with the lower flowers clustered due to condensation of the rachis, 2–8-flowered; *peduncle* 1–2.5 mm long; *rachis* 0.5–5 mm long; *barren basal bracts* numerous, forming an involucre, oblong, imbricate, enclosing buds, striate, ca. 1 mm long; *subtending bracts* spreading, obovate, tridentate, striate, claw fused to pedicel, ca. 3 × 2 mm. *Pedicel* filiform, 1–5 mm long. *Calyx* obconical to campanulate, 1.5–3 mm long including the ca. 1 mm receptacle; upper 2 lobes ± united or with a very shallow sinus, 0.5–1 mm long; lower 3 lobes triangular, acute, occasionally slightly recurved, 0.2–0.75 mm long. *Corolla: standard* transversely broadly elliptic, emarginate, cordate, deeply centrally grooved, 5–6.5 × 6–7 mm including the 1–1.5 mm claw, yellow infused with purple-black or red towards the centre and with a vertical yellow line towards the base in front, deep orange-pink to purple behind; *wings* obovate with a rounded, incurved apex not enclosing the keel, auriculate, 5–6 × 2–2.5 mm including the 1–1.5 mm claw, orange-pink; *keel* half transversely elliptic with an acute apex, falcate, slightly

auriculate, saccate,  $4\text{--}5.5 \times 2$  mm including the 1–3 mm claw, dark purple-red. *Stamens* dimorphic but only in the anthers; inner whorl of 5 with globose anthers with confluent thecae; outer whorl of 5 with narrowly ovoid 2-celled anthers; all filaments equal, free; all anthers basifixed. *Pod* obliquely very broadly obtriangular, shortly acuminate, strongly compressed,  $14\text{--}17 \times 9\text{--}12$  mm; upper suture sigmoid; lower suture acute. *Seed* compressed, ovoid, 3.5 mm long, 2.5 mm wide, 1.5 mm thick, tan with obscure grey markings; *aril* thickly lobed, 1.75 mm long. (Fig. 87).



**FIGURE 87.** *Daviesia debilior* subsp. *debilior*. A. Flowering branchlet. B. Juvenile phyllode. C. Intermediate phyllode. D. Inflorescence. E. Calyx opened out, upper lobes at left. F. Standard. G. Wing. H. Keel. I. Pod. *Daviesia debilior* subsp. *sinuans*. J. Fruiting branchlet. K Seed, lateral view. L. Same, hilar view. A from Chapman (21B)77 (type); B–H from Chapman s.n. (CBG 8004030); I from Chapman (66)77; J from Ising s.n. (AD 97622028); K, L from Demarz 1854. Drawn by A.L. Prowse.

**Flowering period:**—May to July. *Fruiting period:* September to November.

**Distribution:**—Western Australia, from Eneabba south to Darlington (near Perth) and inland to the Wongan Hills.

**Habitat:**—Grows on gravelly lateritic clay or sandy, sometimes gravelly soils, in heath.

**Affinity:**—*Daviesia debilior* belongs to an endemic Western Australian group with numerous moderately enlarged imbricate bracts and frequently leafless branchlets. This group is not to be confused with the *Daviesia* series *Involucratae* (Endl.) Benth., in which the bracts are few, enormous and leaf-like. All but one of the species in the group have a more erect, stronger habit than *D. debilior*.

*Daviesia hakeoides* is easily recognised by its pungent phyllodes. Specimens of *D. hakeoides* subsp. *subnuda* may appear leafless, but they always have some pungent phyllodes at least 2–3 mm long, which is immediately obvious when a finger is run down the branchlet. *Daviesia hakeoides* also differs from *D. debilior* in having pods which are beaked because the lower suture is more or less indented near the apex. In *D. debilior* subsp. *debilior* (q.v.) there is an abrupt transition from fully developed phyllodes to minute scales part-way up the branchlet (Fig. 87A). By contrast, *D. hakeoides* subsp. *hakeoides* reduce gradually all the way up the branchlet, this being the typical condition in the genus.

*Daviesia gracilis* and *D. triflora* are leafless like *D. debilior* subsp. *sinuans* (q.v.), but both differ from it in having larger flowers (standard lamina 6.5–8 mm long, calyx 2.5–3 mm long), differently shaped calyces, and branchlets that are more terete and striate than angular and ribbed.

*Daviesia pseudaphylla* shares with *D. debilior* a weak habit, non-pungent phyllodes and a tendency for the phyllodes to reduce abruptly to scales on the upper portion of the branchlets. *Daviesia pseudaphylla* differs in not having costate branchlets and phyllodes, even when fresh, longer internodes ( $15 \pm 5$  mm s.d.), a clear distinction between lamina and claw in the subtending bracts, larger flowers (e.g. standard ca. 10.5 mm broad, calyx 3–3.5 mm long), deep pink colouring with no central streak on the abaxial face of the standard, and a pod with a strong indentation on the adaxial suture.

*Daviesia hakeoides* subsp. *subnuda* overlaps in distribution with *D. debilior* subsp. *sinuans* and these taxa have been confused. Diagnostic differences are described under the former.

### 87a. *Daviesia debilior* Crisp subsp. *debilior*

Reference: Crisp (1982a: 13), Crisp (1995: 1185).

*Branchlets* gently upcurved, not or slightly sinuous, not glaucous. *Phyllodes* developed, except towards the branchlet apex where they are abruptly reduced to minute scales, angular or compressed, linear, up to  $120 \times 2$  mm, prominently many-ribbed. (Fig. 87A–I).

**Flowering period:**—May to July. *Fruiting period:* September.

**Distribution:**—From the Eneabba area south to near Darlington, near Perth.

**Conservation status:**—National: Not listed. WA: Priority 2, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (17 examined):**—Approximate locality data are given because the species is rare.

**WESTERN AUSTRALIA. Irwin:** W of Three Springs on road to Eneabba,  $29^{\circ}50'S$ ,  $115^{\circ}20'E$ , *C. Chapman* (16)77, 19 June 1977 (CBG, PERTH); SW of Eneabba,  $30^{\circ}S$ ,  $115^{\circ}10'E$ , *C. Chapman* (66)77, 19 June 1977 (CBG, US); *ibid.*, *C. Chapman s.n.*, 17 May 1979 (CBG 8004030, MEL, PERTH). **Darling:** N of Bindoon,  $31^{\circ}10'S$ ,  $116^{\circ}E$ , *B.C. Crisp* 483, 22 August 1977 (CBG); near Darlington,  $32^{\circ}S$ ,  $116^{\circ}E$ , *A. Morrison s.n.*, 19 July 1902 (CANB 578303).

**Affinity:**—Subsp. *sinuans* differs in having sinuous branchlets with sometimes curled apices and phyllodes that are all reduced to minute scales.

**87b. *Daviesia debilior* Crisp subsp. *sinuans* Crisp (1982a: 14), Crisp (1995: 1185).** Type [approximate locality data given because the species is rare]: Wongan Hills area,  $30^{\circ}50'S$ ,  $116^{\circ}40'E$ , 17 July 1980, *M.D. Crisp* 6518, fl., fr., spirit material, photos. Holotype: CBG; isotypes: AD, K, L, MEL, NSW, PERTH

*Branchlets* very weakly ascending, becoming sinuous, occasionally glaucescent, the tips usually very slender (ca. 0.5 mm diam.) and occasionally curled. *Phyllodes* all reduced to scales. (Fig. 87J–L).

**Flowering period:**—May to July. *Fruiting period:* October and November.

**Distribution:**—From near Coorow south to the Moore River and east to the Wongan Hills, Western Australia, occurring farther inland than subsp. *debilior*.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (19 examined):**—Approximate locality data are given because the species is rare.

**WESTERN AUSTRALIA. Irwin:** Near Coorow,  $29^{\circ}50'S$ ,  $116^{\circ}00'E$ , *B.C. Crisp* 490, 23 August 1977 (CBG, PERTH). **Avon:** Wongan Hills area,  $30^{\circ}50'S$ ,  $116^{\circ}40'E$ , *M.D. Crisp* 5490, 26 January 1979 (BISH, CBG, PERTH);

*ibid.*, C.E. Woolcock D11, 15 July 1981 (CBG); E of Moora, 30°40'S, 116°10'E, C.A. Gardner s.n. (PERTH 05195209).

**Affinity:**—Subsp. *debilior* differs in the branchlets not being sinuous, and never glaucescent. The phyllodes are developed except towards the branchlet apex, where they are abruptly reduced to minute scales.

The specimen B.C. Crisp 483 has been included under *D. debilior* subsp. *debilior* but shows some tendency towards subsp. *sinuans*. The branchlets have longer leafless terminal portions than is usual for subsp. *debilior*. In fact, one branchlet has the phyllodes reduced to scales along its entire 30 cm length. In addition, this branchlet is strongly curved upwards and almost sinuous. The specimen is from Wannamal, close to localities of subsp. *sinuans* and farther inland than the other localities of subsp. *debilior*.

**88. *Daviesia gracilis*** Crisp (1984: 160), Crisp (1995: 1196). Replaced synonym: *Daviesia juncea* Smith (1808b: 260), *nom. illeg., non* (H.A. Schrader & J.C. Wendland 1795: 9) Persoon (1805: 454). Type: 'Brought by Mr. Menzies from King George's Sound.' Holotype: King George Sound, west coast of New Holland, lat. 35, 1791, *A. Menzies* (LINN); isotype: BM

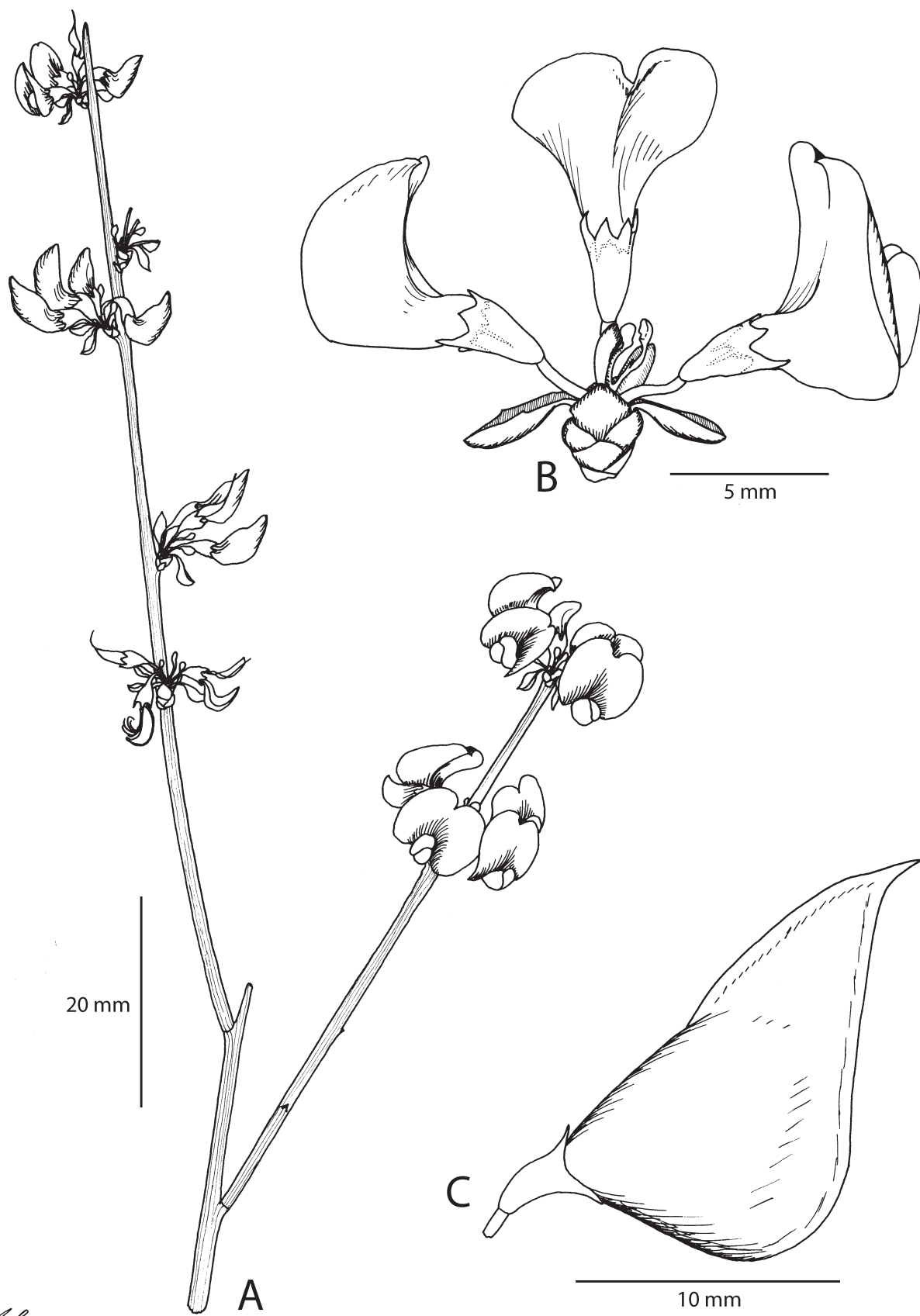
Spreading, diffuse *shrubs*, to 0.5 m high, glabrous. *Root anatomy* anomalous (cord type) but developing only after a long period (years) of unistelar secondary thickening. *Branchlets* weakly ascending, terete, smooth when fresh, striate when dry. *Phyllodes* all reduced to scales. *Unit inflorescences* 1 per axil, modified racemes with the lower flowers clustered due to condensation of the rachis, 3–5-flowered; *peduncle* 1–1.5 mm long; *rachis* 0.5–3 mm long; *barren basal bracts* forming an involucre, ascending, oblong, ca. 1–2 mm long; *subtending bracts* strongly recurved, shell-shaped, striate, with the claw fused to the pedicel for up to half the length of the pedicel, ca. 4 mm long. *Pedicel* 3–6 mm long. *Calyx* 3–3.5 mm long including the ca. 0.75 mm receptacle; 5 nerves usually visible; lower two-thirds pale, upper third including lobes and the 5 major nerves greenish yellow and delineated by a jagged grey line; lobes subequal, triangular, ca. 0.75 mm long; upper 2 lobes united slightly higher than the lower 3; the middle lower lobe juts out beyond the outer two. *Corolla: standard* transversely broadly elliptic, emarginate, 8–9 × 8–8.5 mm including the 1–1.5 mm claw, with 2 small calli at the base of the lamina, orange-yellow with a light maroon ring around the lamina, fading to maroon towards the base, with a faint red ring around the yellow centre, back of standard deep maroon; *wings* obliquely elliptic with a rounded and incurved apex that encloses the keel, auriculate, ca. 7–7.5 × 2.5 mm including the 2 mm claw, maroon; *keel* half transversely elliptic, acute, scarcely auriculate, saccate, ca. 3.5–4.5 × 2 mm including the 1.5 mm claw, maroon. *Stamens* dimorphic but only in the anthers; inner whorl of 5 with globose anthers with confluent thecae; outer whorl of 5 with narrowly ovoid 2-celled anthers; all filaments uniform, free, terete; all anthers basifixed. *Pod* obliquely shallowly obtriangular, acuminate, compressed, 16–19 × 8–9 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 88).

**Flowering period:**—July to October. *Fruiting period:* Beginning in October.

**Distribution:**—Western Australia, from Kojonup south to King George Sound and east to Bremer Bay. Records from the wheatbelt farther north are doubtful, and could be misdeterminations of *D. hakeoides* subsp. *subnuda*.

**Habitat:**—Grows on skeletal stony clay (Ellen Peak) to gravelly sandy or sandy soils, from exposed peaks to sandplains in heath (often closed) with emergent *Eucalyptus* spp., or in open eucalypt woodland.

**Selected specimens (52 examined):**—WESTERN AUSTRALIA. **Darling:** Ca. 60 km NE of Albany, 2.5 km NE of Stirling South, 34°34'E, 118°14'E, M.D. Crisp 6133, et al., 25 September 1979 (CBG); W of Mt Barker, ca. 34°39'S, 117°39'E, A.M. Ashby 3644, 30 September 1970 (AD, B). **Roe:** Jerramungup, 33°57'S, 118°54'E, C.E. Woolcock D80, 31 July 1981 (CBG). **Eyre:** Stirling Range, 1 km N of Ellen Peak, 34°21'S, 118°20'E, M.D. Crisp 5296, 19 January 1979 (CBG); Stirling Range, 3.5 km SE of Bluff Knoll, 34°24'S, 118°16'E, M.D. Crisp 6122 et al., 25 September 1979 (CBG, L, PERTH); Chester Pass Road, at Napier River Crossing, 34°49'S, 117°58'E, J. Taylor 1810 & P. Ollerenshaw, 14 September 1983 (CBG, MEL, PERTH); Kalgan River, ca. 34°31'S, 117°43'E, Oldfield 498 (MEL); Porongorup Range, 34°42'S, 117°53'E, A.B. Cashmore 72, 15 September 1939 (PERTH); 11 km N of Boxwood Hill along Highway 1 towards Jerramungup, 34°17'S, 118°49'E, M.D. Crisp 6076 et al., 22 September 1979 (AD, CBG, K, MEL, PERTH).



**FIGURE 88.** *Daviesia gracilis*. A. Flowering branchlet. B. Inflorescence; note that calyces have a faint grey jagged line demarcating pale yellow-green tips above and a pale tube below. C. Pod. A from *Crisp 6122*; B from *Crisp 6076*; C from *Crisp 5286*. Drawn by A.L. Prowse.



**Affinity:**—*Daviesia gracilis* belongs to a group of species closely related to *D. hakeoides* with moderately enlarged, shell-shaped, usually striate bracts which are imbricate and cover the rachis (Crisp 1982a; 1984), and within this group most closely resembles *D. triflora* and *D. debilior* subsp. *sinuans* in being totally leafless. *Daviesia debilior* differs in having weak, more or less sinuous branchlets and smaller flowers (e.g. calyx 1.5–2 mm long, standard 6–6.5 mm broad) and the calyx is lead grey to the tips of the lobes. *Daviesia triflora* differs in having strictly 3-flowered inflorescences, and the calyx is lead grey and has a truncate upper lip. *Daviesia gracilis* has also been confused with *D. hakeoides* subsp. *subnuda* but the latter always has at least a few small (2–3 mm long), pungent phyllodes, which are readily felt by running a finger down the branchlets.

**89. *Daviesia triflora*** Crisp (1984: 160), Crisp (1987a: 254), Crisp (1995: 1239). Type: 0.6 km W of intersection of Coorow–Green Head road with Brand Hwy, 30°05'S, 115°19'E, *C. Chapman* (16)76, 4 July 1976. Holotype: CBG; isotypes: AD, K, MEL, PERTH

Rush-like, many-stemmed *shrubs*, to 0.6 m high, glabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* erect, terete, subspinescent at tips, smooth when fresh, finely striate when dry. *Phyllodes* all reduced to scales. *Unit inflorescences* 1 per axil, condensed racemes, strictly 3-flowered; *peduncle* ca. 2 mm long; *rachis* ca. 1.5 mm long, produced into an erect, slender, sterile bristle that is ca. 4 mm long, ending in a cluster of reflexed, barren bracts; *barren basal bracts* forming an involucre, shell-shaped; *subtending bracts* spreading, hooded, cuneate or oblong, truncate, imbricate, 5–6 mm long, not fused to the pedicel. *Pedicels* 3–6 mm long. *Calyx* campanulate, 2.5–3.5 mm long including the 0.75 mm receptacle, which is abruptly contracted to the pedicel; upper 2 lobes united in a truncate, emarginate lip, ca. 1.25 mm long; lower 3 lobes shorter, apiculate, ca. 1 mm long. *Corolla: standard* very broadly ovate, emarginate, cordate, 8–9 × 7.5–8 mm including the 1.5 mm claw, yellow or orange-yellow with a dark red centre; *wings* obliquely obovate with a rounded apex, auriculate, 6–6.5 × 2.5 mm including the ca. 2 mm claw, dark red; *keel* transversely to transversely broadly elliptic, acute, falcate, auriculate, saccate, 5–5.5 × 2 mm including the ca. 2 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, compressed, 10–20 × 6–9 mm; upper suture sigmoid; lower suture acute. *Seed* obloid, ca. 4 mm long, 2.25 mm broad, 1.25 mm thick, tan with black mottling; *aril* thickly lobed, oblong in outline, ca. 2 mm long. (Fig. 89).

**Chromosome number:**—2n = 18; voucher *Sands 637.5.6* (Sands 1975).

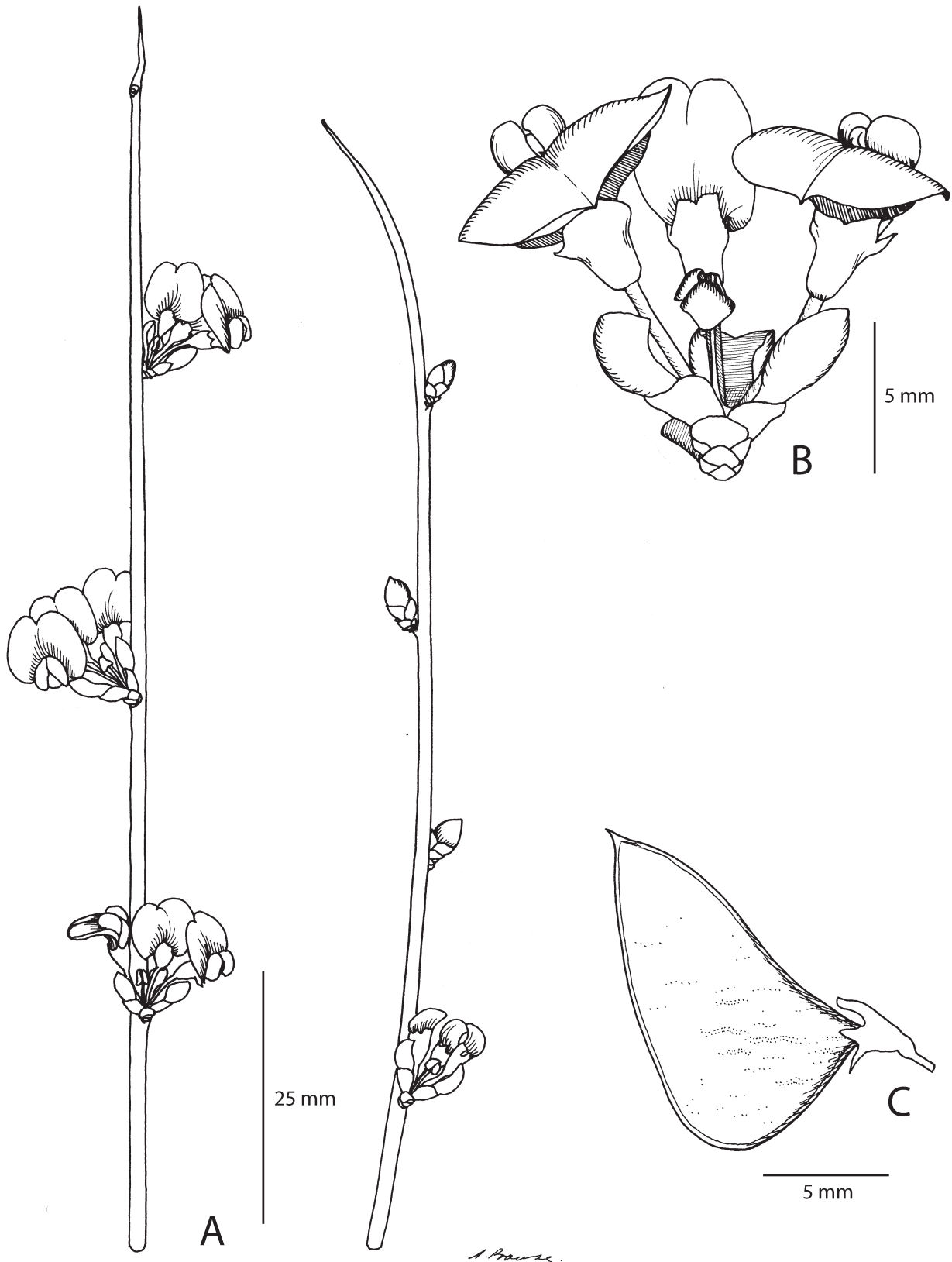
**Flowering period:**—May to September. *Fruiting period:* September and October.

**Distribution:**—Western Australia, mainly on the coastal sandplains from near Mullewa south to Perth.

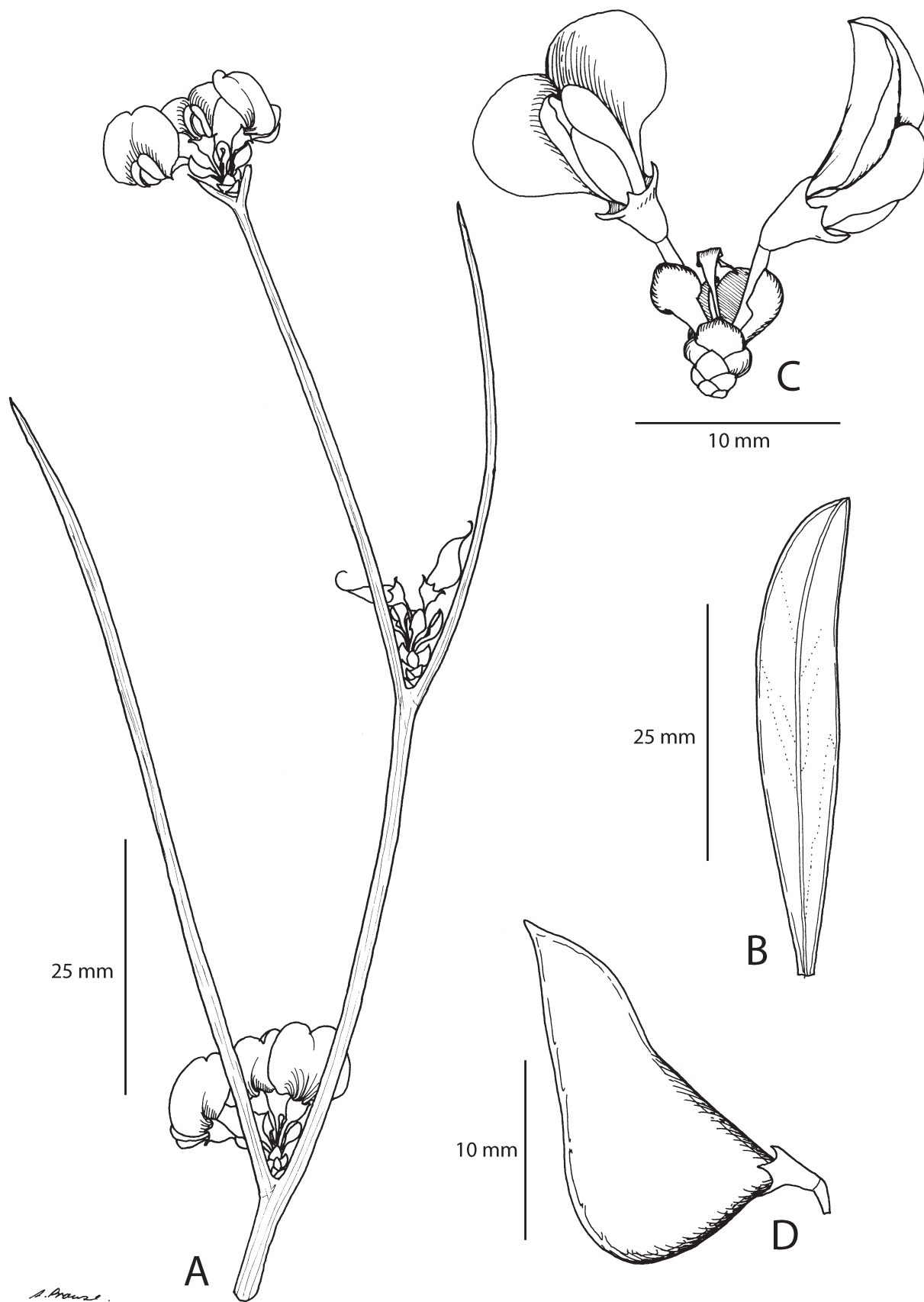
**Habitat:**—Grows on sand or occasionally gravelly lateritic soil, in heath dominated by *Allocasuarina*, *Banksia*, *Adenanthos*, *Callitris* and/or *Eucalyptus todtiana* Mueller (1882: 171), and in open forest dominated by *Eucalyptus marginata*, *E. gomphocephala* Candolle (1828: 320) or *E. wandoo*.

**Selected specimens (62 examined):**—WESTERN AUSTRALIA. **Irwin:** 7 km S of Marchagee, 30°07'S, 116°03'E, *M.D. Crisp 6494*, 16 July 1980 (CBG, PERTH); 148 km NNW of Gingin by road, 30°12'S, 115°23'E, *T.E.H. Aplin 3185 & R. Coveny*, 2 September 1970 (K, L, NSW, PERTH). **Darling:** Kewdale, 31°58'S, 115°58'E, *R. Coveny 8219*, 7 September 1976 (CANB, NSW); ca. 1 km along Karel Avenue from Hope road, Jandakot, 32°07'S, 115°51'E, *T.R. Lally 564 & B. Lepschi*, 2 July 1995 (CANB, PERTH); Subiaco, 31°57'S, 115°49'E, *A. Morrison s.n.*, 12 October 1907 (CANB 336593); 38 km N of Muchea along Brand Highway, 31°15'S, 115°49'E, *M.D. Crisp 6455*, 15 July 1980 (CBG, MEL); 10 km N of Regans Ford, 26 km S of Cataby, Brand Highway, 30°55'S, 115°39'E, *M.D. Crisp 6463*, 15 July 1980 (CBG, NSW); Bull Creek, Canning River, S of Perth, 34°02'S, 116°33'E, *J.R. Knox 650705*, July 1965 (PERTH).

**Affinity:**—*Daviesia triflora* belongs to group of species closely related to *D. hakeoides* with moderately enlarged, shell-shaped, usually striate bracts which are imbricate and cover the rachis (Crisp 1982a; 1984), and within this group, most closely resembles *D. gracilis* and *D. debilior* subsp. *sinuans* in being totally leafless. *Daviesia debilior* differs in having a variable number of flowers (2–4) in the inflorescence, bracts which are all spirally arranged, a receptacle which is more or less tapered to the pedicel, weak, more or less sinuous branchlets and smaller flowers (e.g. calyx 1.5–2 mm long, standard 6–6.5 mm broad). *Daviesia gracilis* differs in its variable number of flowers (3–5), bracts that are all spirally arranged, calyx with greenish-yellow lobes, 2 triangular upper lobes separated by a distinct (0.75 mm deep) sinus and by the tapering receptacle.



**FIGURE 89.** *Daviesia triflora*. A. Branchlets in flower and bud. B. Inflorescence. C. Pod. A, B from *Crisp 6494*; C from *Coveny 8219*. Drawn by A.L. Prowse.



**FIGURE 90.** *Daviesia pseudaphylla*. A. Flowering branchlet. B. Juvenile phyllode. C. Inflorescence. D. Pod. A, C from *Newbey 5113* (type); B, D from *Crisp 5264*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**90. *Daviesia pseudaphylla*** Crisp (1995: 1222). Type [approximate locality data given because the species is rare]: Western Australia, Eyre, Stirling Range, 34°30'S, 118°20'E, *K. Newbey 5113*, 8 September 1978. Holotype: CBG; isotypes: AD, K, MEL, MO, NSW, PERTH

Low, open, spreading, glabrous *shrubs*, to 0.35 m high and 1.3 m broad, apparently increasing by root suckers; stems procumbent; internodes long ( $36 \pm 15$  mm s.d.). *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* terete, smooth when fresh, striate when dry. *Phyllodes* widely scattered, ascending, gently upcurved, terete, not pungent, inarticulate, continuous with and virtually indistinguishable from branchlets, up to 300 mm long, 0.75–1.5 mm diam., smooth when fresh, wrinkled-striate when dry, glaucous in summer, abruptly reduced to minute scales on some branchlets. *Seedling phyllodes* flat, to 8 mm broad. *Unit inflorescences* modified condensed racemes, with the lower flowers clustered due to condensation of the rachis, 2–3-flowered; *peduncle* from almost nil to 1 mm long; *rachis*  $\pm$  nil; *barren basal bracts* forming an involucre, enclosing inflorescence at base, numerous, imbricate, shell-shaped, striate; *subtending bracts* erect, spatulate, shell-shaped, abruptly contracted between lamina and claw, partly fused to the pedicel. *Pedicels* equal to bracts, ca. 4 mm long. *Calyx* 3–3.5 mm long; upper 2 lobes united in a bidentate lip, ca. 1 mm long; lower 3 lobes acuminate, ca. 1 mm long. *Corolla: standard* transversely broadly elliptic, 9–10  $\times$  8–10 mm including the 2.5 mm claw, predominantly yellowish orange adaxially, dark purple with a yellow streak abaxially; *wings* obovate, auriculate, ca. 8  $\times$  2.5 mm including the 2 mm claw, dark reddish; *keel* half broadly elliptic, scarcely acute, scarcely auriculate, saccate, ca. 6  $\times$  2 mm including the 1.5 mm claw, dark reddish. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and oblong, basifixed, 2-celled anthers; filaments free; vexillary filament rather thick and adaxially channelled. *Pod* obliquely shallowly obtriangular, scarcely acute, indented above the middle of the adaxial suture, 14–17(–20)  $\times$  9–10 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 90).

**Flowering period:**—July to September. *Fruiting period:* Unknown.

**Distribution:**—Known only from the vicinity of the type locality in Stirling Range National Park, Western Australia.

**Habitat:**—Grows in stony light grey sand on an exposed gentle south slope near the foot of the range in heath with emergent eucalypts and *Lambertia*.

**Conservation status:**—National: Endangered. WA: Critically Endangered, Declared Rare Flora.

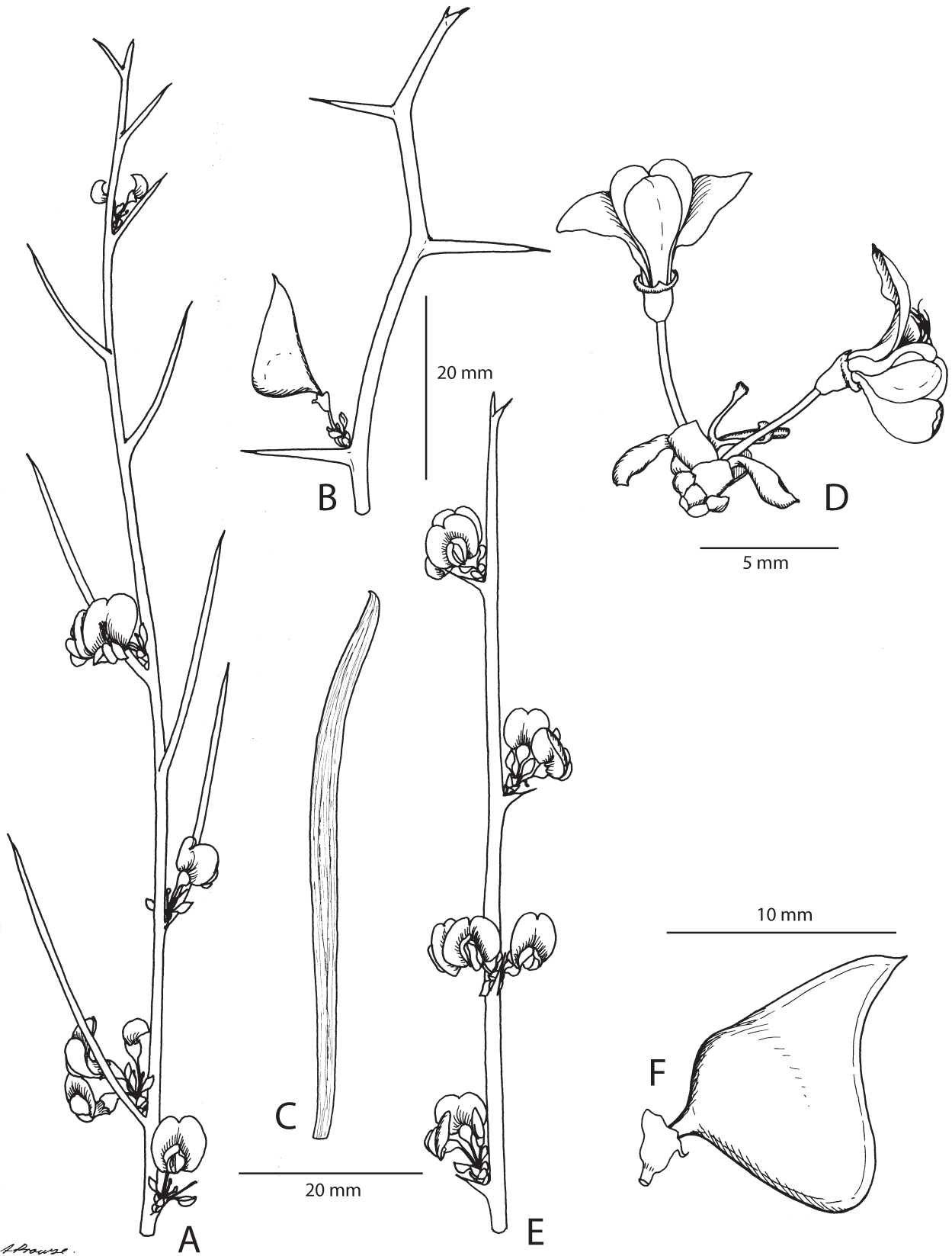
**Additional specimens examined:**—Approximate locality data are given because the species is rare.

**WESTERN AUSTRALIA. Eyre:** Stirling Range, 34°30'S, 118°20'E, *M.D. Crisp 5264*, 18 January 1979 (CBG, PERTH); *ibid.*, *A.S. Weston 9481*, 9 July 1974 (L, PERTH).

**Affinity:**—*Daviesia pseudaphylla* belongs to a natural group with moderately enlarged, shell-shaped, usually striate bracts which are imbricate and cover the rachis (Crisp 1982a; 1984), including *D. hakeoides*, *D. debilior* and *D. major*. Within this group, *D. debilior* is closest to *D. pseudaphylla*, sharing with it a weak habit, non-pungent phyllodes and a tendency for the phyllodes to reduce abruptly to scales on the upper portion of the branchlets. *Daviesia debilior* differs from *D. pseudaphylla* in having costate branchlets and phyllodes, even when fresh, shorter internodes ( $15$  mm  $\pm$  5 s.d.), no clear distinction between lamina and claw in the subtending bracts, smaller flowers (e.g. standard 6–6.5 mm broad, calyx 1.5–2 mm long), deep pink colouring with no central streak on the abaxial face of the standard, and a pod with no strong indentation on the adaxial suture.

**91. *Daviesia hakeoides*** Meisner (1844: 47), Crisp (1987a: 250), Crisp (1995: 1196). Type: Syntypes are cited under the subspecies below. Lectotype (Crisp 1995: 1196): *Preiss 1156* (LD); isolectotypes: GOET, K, MEL (2 sheets), MO, NY, P (2 sheets), W (2 sheets)

Intricate, many-stemmed *shrubs*, 0.3–1 m tall and 0.5–2 m broad, glabrous, glaucescent. *Root anatomy* in both subspecies with anomalous secondary thickening (cord roots). *Branchlets* spreading to ascending, terete, smooth when fresh, striate when dry. *Phyllodes* scattered, divaricate to erect, terete, pungent, inarticulate and continuous with the branchlet, 0–80 mm long and up to 1.5 mm broad at base, striate when dry, or often reduced to scales over most of plant. *Juvenile phyllodes* flat, narrow-oblong, 17–25  $\times$  ca. 5 mm (*Crisp 6625*). *Unit inflorescences* 1 per axil, condensed racemes with the lower flowers clustered due to condensation of the rachis, 2–6-flowered, enclosed at base by large, overlapping bracts; *peduncle* 1–1.5 mm long; *rachis* very short ( $< 2$  mm long); *barren basal bracts*



**FIGURE 91.** *Daviesia hakeoides* subsp. *hakeoides*. A. Flowering branchlet (typical form with ascending phyllodes). B. Fruiting branchlet (northern form with divaricate phyllodes). C. Basal linear phyllode. D. Inflorescence. *Daviesia hakeoides* subsp. *subnuda*. E. Flowering branchlet. F. Pod. A, D from *Crisp* 6620; B from *Crisp* 6263; C from *Crisp* 6622; E from *Crisp* 6511; F from *Crisp* 6321. Drawn by A.L. Prowse.

forming an involucre, shell-shaped to oblong, ca. 1–2 mm long; *subtending bracts* ascending, spatulate, shell-shaped, striate, claw fused to pedicel for up to 1 mm, up to 3.5 mm long. *Pedicels* 1–6 mm long. *Calyx* 2–2.5 mm long including the ca. 0.5 mm receptacle; lobes very short (< 0.25 mm long); upper 2 lobes ± united; lower 3 lobes acuminate, flared outwards then incurved at the tips; base of receptacle abruptly contracted to articulation with pedicel. *Corolla*: *standard* transversely broadly elliptic, emarginate, cordate, 4.5–6 × 5–7 mm including the ca. 1 mm claw, with a deep channel and 2 small calli towards the base of the lamina, yellow or orange with a dark red centre; *wings* obliquely obovate with a rounded and incurved apex that encloses the keel, auriculate, 5–5.5 × 2–2.5 mm including the 1–1.5 mm claw, dark red; *keel* half transversely broadly elliptic with an acute apex, slightly auriculate, saccate, ca. 5 × 1.75 mm including the 1.5–2 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly obtriangular, more or less beaked, somewhat turgid, 14–17 × 10–11 mm, thick-walled; upper suture ± sigmoid; lower suture forming an acute angle centrally and indented towards the apex. *Seed* with a continuous aril. (Fig. 91).

**Flowering period:**—May to July. **Fruiting period:** August to November.

**Distribution:**—South-west Western Australia from north of Kalbarri southward to near Albany and inland in the northern, central and southern wheatbelt.

**Affinity:**—This species belongs to a group of closely related species with moderately enlarged, shell-shaped, usually striate bracts that are imbricate and cover the rachis (Crisp 1982a; 1984), and subsp. *hakeoides* is most similar to *D. debilior* subsp. *debilior*, *D. major* and *D. smithiorum* (see discussion under subsp. *hakeoides*). *Daviesia hakeoides* subsp. *subnuda* has been confused with *D. debilior*, *D. gracilis* and *D. triflora* (see discussion under subsp. *subnuda*).

#### 91a. *Daviesia hakeoides* Meisn. subsp. *hakeoides*

References: Crisp (1984: 163), Crisp (1987a: 250), Crisp (1995: 1197).

*Daviesia hakeoides* Meisn. f. *gracilentata* Meisner (1844: 47). Type: ‘...in colonia ad fl. Cygnor., Jac. Drummond, No. 258.’ Holotype: BM; isotypes: CGE, G, K (2 sheets), OXF, P (2 sheets).

*Daviesia hakeoides* Meisn. f. *intermedia* Meisner (1844: 47). Type: ‘...in solo sublimoso ‘Colonial Church Grant’ (Perth) d. 29 June 1839. no. 1157—Preiss.’ Lectotype (Crisp 1995: 1197): LD; isolectotype: BR, FI-W, G (2 sheets), GOET, K, MEL (4 sheets), NY, P (2 sheets), S, W (2 sheets).

*Daviesia hakeoides* Meisn. f. *robusta* Meisner (1844: 47). Type: ‘Inter fragmenta rupium prope Cataractam ad caput fl. Cygnorum, d. 25. Jul. Herb. Preiss. no. 1156.’ Lectotype (Crisp 1995: 1198): LD; isolectotype: BR, G (3 sheets), GOET, K, MEL (2 sheets), MO, NY, P (2 sheets), W (2 sheets).

*Phyllodes* 10–80 mm long, terete; lower phyllodes often compressed or flattened and linear, to 3 mm broad. (Fig. 91A–D).

**Distribution:**—Western Australia, from Kalbarri south to near Bunbury and Katanning.

**Habitat:**—On lateritic or sandy soil in open forest of jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) or woodland of *Eucalyptus wandoo*.

**Selected specimens (54 examined):**—WESTERN AUSTRALIA. **Irwin:** Murchison House Station, 27°39’S, 114°14’E, *C.H. Gittins 1644*, August 1967 (BRI, NSW, PERTH); 9 km S of Mingenew, 29°18’S, 115°16’E, *J.W. Green 1388*, 1 July 1957 (PERTH); 10 km N of Junga Dam, Kalbarri National Park, 27°39’S, 114°21’E, *P.G. Wilson 6665*, 11 May 1968 (PERTH); 25 km W of Arrino, 29°23’S, 115°28’E, *C. Chapman (53)77*, 21 August 1977 (CBG, MEL, PERTH); 40 km NW of Highway 1 along road to Kalbarri, 27°45’S, 114°23’E, *M.D. Crisp 6263*, et al., 30 September 1979 (CBG). **Avon:** Koolanooka, 29°16’S, 116°05’S, *C.E. Woolcock D262 & D.T. Woolcock*, 22 August 1982 (CBG); Perenjori, 29°26’S, 116°17’E, *C.E. Woolcock D4*, 16 July 1981 (CBG). **Darling:** Darling Range, 2 km NE of Great Northern Highway, from 22 km N of Bullsbrook, 31°30’S, 116°03’E, *M.D. Crisp 6642*, 21 July 1980 (CBG, NSW, PERTH); Woorlolo, 31°48’S, 116°18’E, *M. Koch 1717*, September 1907 (AD); Darling Range, 52 km N of Midland and 2 km N of Chittering along Great Northern Highway, 31°27’S, 116°03’E, *M.D. Crisp 6620–8*, 21 July 1980 (CBG with some duplicates in AD, NSW, PERTH); Darling Range, 55 km N of Midland and 6 km S of Bindoon along Great Northern Highway, 31°26’S, 116°04’E, *M.D. Crisp 6630*, 21 July 1980 (CBG, MEL, PERTH).

**Affinity:**—Differs from subsp. *subnuda* in having longer phyllodes ≥ 10 mm long. Similar to *D. debilior*

subsp. *debilior* but the latter has non-pungent fully developed phyllodes that abruptly give way to minute scales part-way up the branchlet, as opposed to the pungent phyllodes of *D. hakeoides* subsp. *hakeoides* that gradually reduce in size towards the branchlet tips. *Daviesia major* differs in having acuminate calyx-lobes, each with a pale stripe, larger flowers (e.g. standard 11–12 mm broad) and a non-turgid viscid pod that lacks a beak. *Daviesia smithiorum* is vegetatively very similar to *D. hakeoides* subsp. *hakeoides* except that the stems are glaucous to pruinose near the base. *Daviesia smithiorum* also differs in having a pod that is neither turgid nor bluntly beaked and tends to be purplish.

**91b. *Daviesia hakeoides* Meisn. subsp. *subnuda* (Benth.) Crisp (1984: 163), Crisp (1987a: 250), Crisp (1995: 1197). *Daviesia hakeoides* Meisn. var. *subnuda* Bentham (1864: 83). Type: ‘Drummond, n. 42.’ Holotype: K**

*Daviesia juncea* Smith (1808b: 260) var. *spinescens* Moore (1920: 169). Type: ‘Wickepin; Stoward, 108. Wundowie; Id., 261. Kauring; G.W. Brown (Hb. Stoward, 572).’ Lectotype (Crisp 1984: 163): Wickepin, *Stoward 108* (BM). Syntype: Wundowie, *Stoward 261* (BM). Syntype: Kauring, near Greenhills, *G.W. Brown*, Herb. Stoward 572 (BM).

*Phyllodes* < 10 mm long and up to 1.5 mm broad at base, often very small or apparently absent but can be felt as sharp spines. (Fig. 91E, F).

**Distribution:**—Western Australia, mainly inland of subsp. *hakeoides*, from Yuna south to Mount Barker and in the northern, central and southern wheatbelt.

**Habitat:**—Grows on drier sites than subsp. *hakeoides*, more commonly occurring in kwongan (heath) than in jarrah-marri forest.

**Selected specimens (85 examined):**—WESTERN AUSTRALIA. **Irwin:** 64 km from Coorow on Green Head road, 30°04’S, 115°30’E, *C. Chapman (15)76*, 4 July 1976 (AD, CBG, MEL, PERTH). **Darling:** Great Northern Highway, 69 mile peg, *R.T. Lange s.n.*, 2 August 1957 (PERTH 5197740); 77.9 km N of Fewsters, 31°17’S, 116°06’E, *C. Chapman (29)77*, 28 June 1977 (CBG, MEL); 1.8 km N of Mogumber, 31°01’S, 116°02’E, *C. Chapman (30)77*, 3 July 1977 (CBG, K, PERTH). **Avon:** Bencubbin, 30°49’S, 117°51’E, *E. Wittwer 1216*, 16 June 1974 (PERTH); 12 km SW of Ballidu, 30°39’S, 116°39’E, *M.D. Crisp 6511*, 17 July 1980 (CBG); Wattergutten, 17 km SW of Manmanning, 30°58’S, 116°59’E, *B.H. Smith 662*, 7 July 1986 (CBG, MEL); 5 km NW of Wongan Hills town, 30°52’S, 116°41’E, *M.D. Crisp 6321 et al.*, 2 October 1979 (BRI, CBG); near Toodyay, 31°33’S, 116°28’E, *M.E. Phillips s.n.*, 19 September 1962 (CBG 19017); 13 km E of Watheroo, 30°19’S, 116°11’E, *M.D. Crisp 6495*, 16 July 1980 (CBG, NSW, PERTH). **Eyre:** Mt Barker, 34°38’S, 117°40’E, *R. Helms s.n.*, December 1898 (PERTH 5209773); King George Sound, 35°03’S, 117°58’E, *F. Mueller s.n.*, November 1877 (MEL 0078953A).

**Affinity:**—Differs from subsp. *hakeoides* in having shorter phyllodes < 10 mm long. Similar to *D. debilior*, *D. gracilis* and *D. triflora*, but all three of these species are quite leafless (running a finger down the branchlets of subsp. *subnuda* immediately reveals the presence of the pungent phyllodes), and *D. triflora* has a strictly 3-flowered inflorescence. *Daviesia debilior* subsp. *sinuans* is very similar to and overlaps in distribution with *D. hakeoides* subsp. *subnuda* but, in addition to the complete absence of phyllodes, may be distinguished by the pods, which have an evenly curved, obtuse lower suture (not indented near the apex) and by the calyx, in which the lower three lobes are neither flared outwards or incurved at the tips.

**92. *Daviesia smithiorum* Crisp (1995: 1235). Type: Western Australia, Avon [approximate locality data given because the species is rare]: Dowerin–Wyalcatchem area, 31°10’S, 117°10’E, *B.H. Smith 848*, 27 June 1987. Holotype: CBG; isotypes: K, NSW, PERTH**

*Shrubs* with many stems from a tap-root, to 0.5 m high, glabrous, glaucous to pruinose. *Root anatomy* unknown. *Branchlets* scattered, erect to ascending at 45°, striate when dry, pruinose, especially towards the base. *Phyllodes* scattered, ascending at 10–45 (80)°, terete, rather slender, gently tapered from base to apex, apically uncinat and pungent, inarticulate and continuous with branchlet, 10–50(–100) mm long, 0.5–1 mm diam. at base, striate at least when dry, glaucous. *Unit inflorescences* 1 per axil, condensed racemes, 2–4-flowered; *peduncle* ca. 1 mm long; *rachis* short (< 2 mm) and covered by bracts; *barren basal bracts* forming an involucre, ca. 1–1.5 mm long; *subtending bracts* not or scarcely spreading, imbricate and enclosing inflorescence, spatulate, cupped with incurved margins, ca. 4 × 1.5 mm, faintly striate, not fused to the base of the pedicels, yellow-brown. *Pedicels*



FIGURE 92. *Daviesia smithiorum*. Holotype. Photograph provided by the Curator of CANB.

2.5–5 mm long. *Calyx* ca. 2.5 mm long including the ca. 0.5 mm receptacle; tips of lobes and sinuses paler than body of calyx; lobes well developed, upper 2 lobes broadly triangular, united higher than lower 3, ca. 0.5 mm long; lower 3 lobes acute or acuminate, ca. 0.5 mm long. *Corolla* yellow-orange or orange, with red markings: *standard*



transversely broadly elliptic, emarginate,  $6.5 \times 6-7$  mm including the 1.5 mm claw, slightly thickened about central groove; *wings* narrowly spatulate, rounded and incurved at apex, enclosing the keel, auriculate, ca.  $5.5 \times 2$  mm including the 1.5 mm claw; *keel* half broadly elliptic, acute, abaxially slightly roughened, scarcely auriculate, saccate, ca.  $5.5 \times 1.75$  mm including the 1.5 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; filaments free; vexillary filament narrow (like others of inner whorl), but channelled. *Pod* obliquely shallowly obtriangular, acute, compressed,  $15-17 \times 10-11$  mm, purplish; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 92).

**Flowering period:**—June. *Fruiting period:* October and November.

**Distribution:**—Western Australia, north-central wheatbelt, restricted to the Dowerin–Wyalcatchem area.

**Habitat:**—Grows in white sand in heath with *Acacia*, *Allocasuarina*, *Conospermum* Smith (1798: 213), *Grevillea*, *Melaleuca* and *Verticordia*.

**Conservation status:**—National: Not listed. WA: Priority 2, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (14 examined):**—Approximate locality data are given because the species is rare.

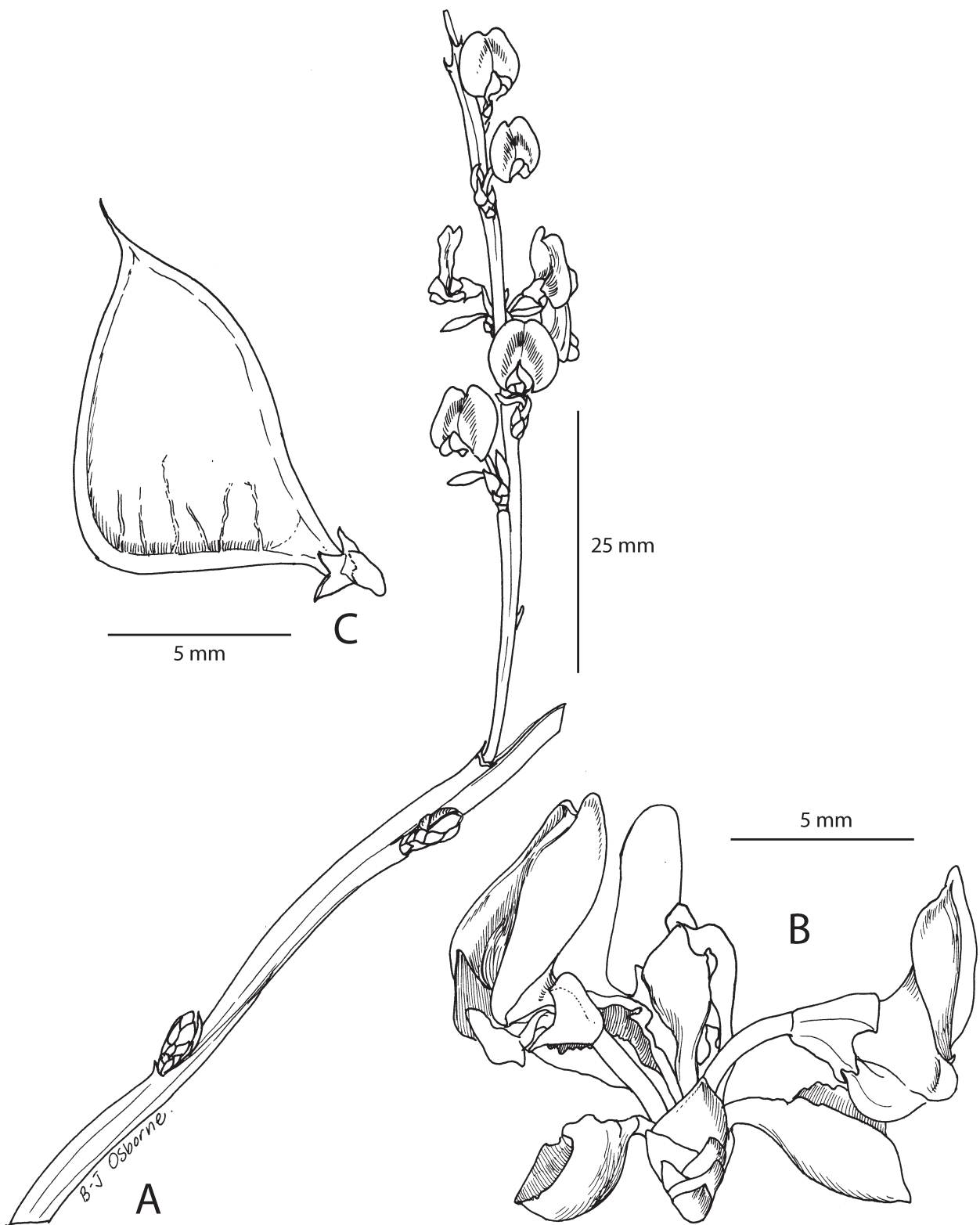
**WESTERN AUSTRALIA.** **Avon:** Dowerin–Wyalcatchem area,  $31^{\circ}10'S$ ,  $117^{\circ}10'E$ , *B.H. Smith 1028*, 21 November 1987 (CBG, PERTH); *ibid.*, *M.D. Crisp 9029 & W. Keys*, 26 October 1996 (CBG, PERTH); *ibid.*, *B.H. Smith 653*, 15 June 1986 (CBG, MEL); *ibid.*,  $31^{\circ}20'S$ ,  $117^{\circ}10'E$ , *B.H. Smith 1032*, 21 November 1987 (CBG); *ibid.*, *B.H. Smith 1034*, 21 November 1987 (CBG).

**Affinity:**—This species belongs to a group related to *D. hakeoides* with moderately enlarged, shell-shaped, usually striate bracts that are imbricate and cover the rachis (Crisp 1982a; 1984), and is most similar to *D. debilior* subsp. *debilior*, *D. hakeoides* subsp. *hakeoides*, *D. major* and *D. pseudaphylla*. It differs from all these in having glaucous to pruinose stems and uncinatate phyllodes (some of these species can be glaucous, however); moreover, in *D. debilior* and *D. pseudaphylla*, the phyllodes are not pungent. Additional distinguishing features of *D. debilior* are the suppression of phyllodes at the branchlet apex, smaller bracts (subtending bracts ca. 3 mm long) and flowers (e.g. calyx 1.5–2 mm long). *Daviesia hakeoides* subsp. *hakeoides* differs further from *D. smithiorum* in having a pod that is somewhat turgid, bluntly beaked and not purplish. *Daviesia major* is further distinguished by having reflexed subtending bracts, acuminate calyx-lobes, each with a pale stripe, a larger standard (11–12 mm broad), and a viscid pod. *Daviesia pseudaphylla* is coarser in all its vegetative parts, the phyllodes are neither uncinatate nor pungent, and its habit is procumbent, but otherwise it appears closely related to *D. smithiorum*; in particular, the floral parts and pod are very similar.

**93. *Daviesia pteroclada*** Crisp (1995: 1223). Type [approximate locality data given because the species is rare]: Western Australia, Irwin, near Green Head,  $30^{\circ}S$ ,  $115^{\circ}30'E$ , *C. Chapman s.n.*, 1 August 1978. Holotype: CBG 9408372; isotypes: K, L, MEL, NSW, PERTH

Broom-like leafless *shrubs*, to 1.8 m tall, glabrous, glaucescent. *Root anatomy* normal (unistelar) or with anomalous secondary thickening (cord type). *Branchlets* erect or ascending, modified to cladodes, narrowly winged, compressed or triquetrous,  $1.5-3.5(-8)$  mm broad, striate between the sharp ridges, even when fresh. *Phyllodes* reduced to scales in the adult plant. *Seedling phyllodes* at first narrowly obovate and horizontally flattened (nodes 1–4), becoming vertically compressed and subulate (nodes 6–8), reduced to scales thereafter. *Unit inflorescences* 1 per axil, racemes with the lower flowers clustered due to condensation of the rachis, 2–4-flowered; *peduncle* up to 1 mm long; *rachis* 0.5–2 mm long and concealed by the imbricate *basal barren bracts*; *subtending bracts* spreading, spatulate, abruptly contracted to the petiole-like base, with margins incurved, faintly striate, fused at the base of the pedicel, ca. 5 mm long. *Pedicels* thickening towards the apex, 2.5–3.5 mm long. *Calyx* 2–2.5 mm long including the ca. 0.5 mm receptacle; upper 2 lobes united in a truncate, emarginate lip, ca. 0.75 mm long; lower 3 lobes triangular, acuminate, ca. 0.25 mm long. *Corolla*; *standard* transversely broadly elliptic, emarginate,  $6.5-8 \times 7-8$  mm including the ca. 1 mm claw, deeply channelled near the base, orange at margins and grading through to dark red (or dark grey) towards centre, with blackish veins, lacking a central yellow mark, fading with age to yellow and light grey; *wings* spatulate, abaxial margins divergent, apically incurved and scarcely overlapping the keel, auriculate,  $4.5-5 \times 2-2.5$  mm including the ca. 1 mm claw, dark grey grading to red at tips and margins; *keel* half transversely broadly elliptic, acute, abaxially rugose, auriculate, saccate,  $3.5-4 \times 1.75-2$  mm including the 1–1.5 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, filiform

filaments and shorter, versatile, anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and longer, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acute, compressed, 10–12 × 7–8 mm, rather thin-walled; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, 3.6–4.7 mm long, ca. 2.5 mm broad, ca. 1.5 mm thick, light to dark brown with black mottling; *aril* 1.5–2.5 mm long. (Fig. 93).



**FIGURE 93.** *Daviesia pteroclada*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *Crisp 5430*; B from *Chapman s.n.* (CBG 7805042); C from *Gardner 9429*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Flowering period:**—July and August (January). *Fruiting period:* August to October.

**Distribution:**—Western Australia, from near Eneabba south towards Mt Lesueur.

**Habitat:**—Grows in sandy clay to sandy loam in woodland-heath with *Eucalyptus wandoo*.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (12 examined):**—Approximate locality data given because the species is rare.

**WESTERN AUSTRALIA. Irwin:** E of Mt Peron, 30°10'S, 115°20'E, *C.A. Gardner 9429 per F.A. Grigson*, 26 August 1949 (PERTH); between Green Head and Eneabba, 30°S, 115°10'E, *M.D. Crisp 5430*, 24 January 1979, flowering adult (CBG, PERTH); *ibid.*, *Crisp 5431*, 24 January 1979, seedling (CBG, PERTH); *ibid.*, *D. Kitchener 65*, 27 October 1973 (PERTH); *ibid.*, *C. Chapman (35)76*, 3 August 1976 (AD, CBG, K, MEL, MO, NSW, PERTH, UWA).

**Affinity:**—The only other species in the genus with phyllodes reduced to scales and narrowly winged, triquetrous cladodes, is *D. alata*. However, this species is not closely related to *D. pteroclada* and differs in floral and fruiting morphology; for example the bracts and calyx-lobes are conspicuously fimbriate, and the peduncle is up to 3.5 mm long. Also, *D. alata* has a procumbent to prostrate habit.

Instead, *D. pteroclada* is closely related to *D. hakeoides* (Fig. 1B) within a group of species with moderately enlarged, shell-shaped, usually striate bracts which are imbricate and cover the rachis (Crisp 1982a; 1984). From all members of this group it is immediately distinguished by its leafless, triquetrous branchlets. *Daviesia debilior*, *D. gracilis* and *D. triflora* are at least partly leafless but their branchlets are terete.

**94. *Daviesia sarissa*** Crisp (1995: 1233). Type: Western Australia, Eyre, near Lake Chidnup, 29 km NW of Ravensthorpe, 33°21'S, 119°52'E, *M.D. Crisp 999*, 9 August 1975. Holotype: CBG; isotype: PERTH

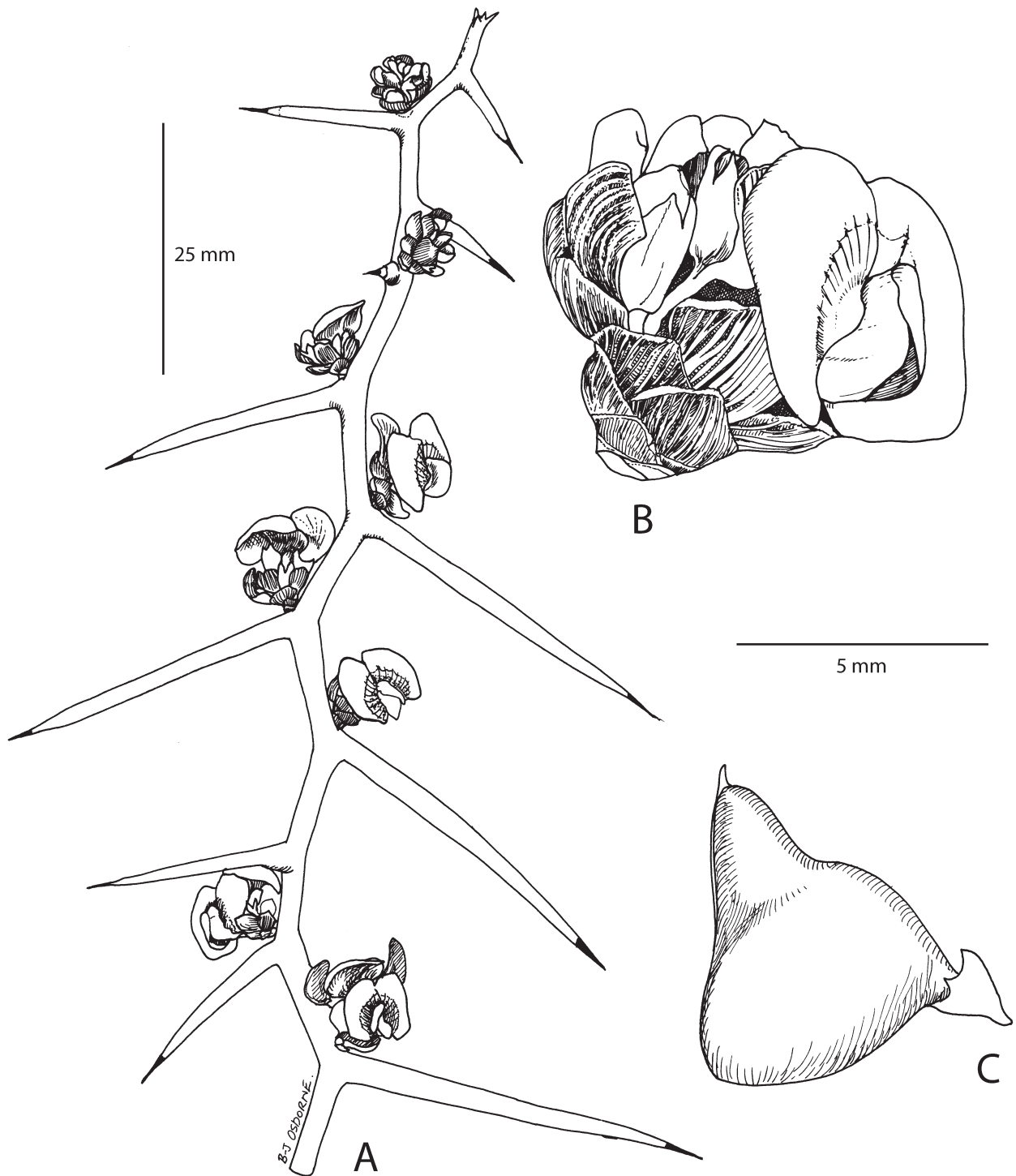
Spreading or sprawling *shrubs*, to 0.5 m high and 0.8 m wide, glabrous, glaucous. *Root anatomy* unknown. *Branchlets* and phyllodes very rigid, smooth both fresh and dry, or somewhat wrinkled when dry. *Phyllodes* scattered, widely spreading (from slightly antrorse to slightly retrorse), terete, tapered gently from base to apex, fiercely pungent, inarticulate, continuous with and resembling branchlets, 10–80 mm long, 1–2 mm diam. at base, smooth when fresh and obscurely wrinkled-striate when dry. *Unit inflorescences* 1 per axil, racemose or cluster-like, 3–6-flowered; *peduncle* ca. 1 mm long; *rachis* 1–3 mm long; *barren basal bracts* forming an involucre, appressed, sessile, with scarious margins; *subtending bracts* spreading, clawed, polished golden brown, fused at very base of pedicel, either large (3–5 × 2–3 mm), imbricate, prominently striate and covering inflorescence (subsp. *sarissa*), or smaller (1.5–2 × 0.75–1 mm), obscurely striate and not covering inflorescence (subsp. *redacta*). *Pedicels* 0.5–3 mm long. *Calyx* 2.5–3.5 mm long including the ca. 0.75 mm receptacle; lobes subequal, acuminate, paler than body of calyx; upper 2 united closer together than the lower 3, ca. 0.25 mm long; lower three ca. 0.5 mm long. *Corolla: standard* transversely broadly elliptic, emarginate, somewhat cordate, 5.5–7 × 5.5–6.5 mm including the 1.5 mm claw, adaxially orange-yellow towards margins with a central dark red flare, abaxially red to dark red; *wings* spatulate, incurved at apex, overlapping to enclose the keel, auriculate, 4–5 × 2.25–2.5 mm including the 1.5 mm claw, red; *keel* half transversely broadly elliptic, acute, abaxially rugose, auriculate, saccate, 3.5–4.5 × 1.5–1.75 mm including the 1–1.5 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with terete filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with compressed filaments and oblong, basifixed, 2-celled anthers; filaments free; vexillary filament adaxially channelled, embracing gynoeceum, flared into a pedestal at apex. *Pod* obliquely shallowly obtriangular, constricted at apex into a blunt beak, slightly turgid, 7–8 × 5–6 mm; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 94).

**Flowering period:**—July to September. *Fruiting period:* Unknown.

**Distribution:**—Two disjunct areas of occurrence in Western Australia: one from Southern Cross towards Coolgardie, and the other farther south, from Pingaring through Newdegate to south of Lake King.

**Affinity:**—This species belongs to a natural group related to *D. hakeoides*, with moderately enlarged, shell-shaped, usually striate bracts which are imbricate and cover the rachis (Crisp 1982a; 1984), and is similar to *D. hakeoides*, *D. major* and *D. smithiorum*. It differs from all these in having very smooth branchlets and phyllodes, which may be longitudinally wrinkled when dry; the other species have striate branchlets and phyllodes, at least when dry. Moreover, in *D. sarissa*, the phyllodes are thick (1–2 mm at the base) and mostly spreading at right angles, whereas in the other species, they are thinner ( $\leq 1.5$  mm) and more or less ascending. In *D. major*, the

phyllodes are sometimes spreading widely; such plants may be distinguished from *D. sarissa* by their reflexed subtending bracts, larger (11–12 mm broad) standard and longer (12–14 mm), viscid, acute pods.



**FIGURE 94.** *Daviesia sarissa* subsp. *sarissa*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 1005*; C from *Crisp 4995*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**94a. *Daviesia sarissa* Crisp subsp. *sarissa***

Reference: Crisp (1995: 1234).

*Bracts* subtending pedicels imbricate and concealing inflorescence at anthesis, 3–5 mm long, 2–3 mm broad, striate

with many prominent ribs. *Pedicels* 0.5–1.5 mm long. *Calyx* including receptacle ca. 2.5 mm long. *Corolla: standard* ca. 5.5 × 5.5–6 mm including the 1.5 mm claw; *wings* 4 × 2.25 mm including the 1.5 mm claw; *keel* 3.5 × 1.5 mm including the 1 mm claw. (Fig. 94).

**Flowering period:**—July and August. *Fruiting period:* Unknown.

**Distribution:**—Western Australia, from Pingaring through Newdegate to south of Lake King.

**Habitat:**—Grows in sand, sometimes gravelly, or sandy loam in heath with *Eucalyptus pleurocarpa* and shrubs of Myrtaceae and Proteaceae.

**Selected specimens (13 examined):**—**WESTERN AUSTRALIA.** **Roe:** 20 km S of Lake King township and 8 km W of Lake King to Ravensthorpe road, 33°16'S, 119°41'E, *P.G. Wilson 6974*, 10 August 1968 (PERTH); Lake Grace, 33°06'S, 118°28'E, *C.E. Woolcock D67a*, 28 July 1981 (CBG); by Ravensthorpe–Lake King road, 11 km SSE of Lake King, 33°11'S, 119°50'E, *M.D. Crisp 1005*, 9 August 1975 (CBG); 18 km E of Newdegate on Lake King road, 33°06'S, 119°10'E, *C.E. Woolcock D258 & D.T. Woolcock*, 12 August 1982 (CBG). **Eyre:** Pallarup Rocks, SE of Lake King, 33°15'S, 119°46'E, *A.S. George 5696*, 30 August 1963 (CANB, PERTH); 7 km W of Ravensthorpe–Lake King road, 20 km S of Lake King, 33°16'S, 119°41'E, *M.D. Crisp 4995*, 10 January 1979 (CBG, K, MEL).

**Affinity:**—Differs from subsp. *redacta* mainly in the bracts, which overlap to conceal the inflorescence, and are prominently striate and shorter than in subsp. *redacta* (subsp. *redacta* 1.5–2 mm long). The flowers of subsp. *redacta* are generally larger (e.g. calyx ca. 3–3.5 mm long, standard ca. 6.5 mm broad).

**94b. *Daviesia sarissa*** Crisp subsp. *redacta* Crisp (1995: 1234). Type: Western Australia, Coolgardie [approximate locality data given because the subspecies is rare]: E of Southern Cross, 31°20'S, 120°E, *A. Strid 20051*, 2 September 1982. Holotype: CANB; isotypes: C, CBG, K, PERTH

*Bracts* subtending pedicels neither imbricate nor concealing inflorescence, 1.5–2 mm long, 0.75–1 mm broad, inconspicuously striate with few ribs. *Pedicels* 1.5–3 mm long. *Calyx* ca. 3–3.5 mm long including the ca. 0.75 mm receptacle. *Corolla: standard* ca. 7 × 6.5 mm including the 1.5 mm claw; *wings* ca. 5 × 2.5 mm including the 1.5 mm claw; *keel* ca. 4.5 × 1.75 mm including the 1.5 mm claw.

**Flowering period:**—September. *Fruiting period:* Unknown.

**Distribution:**—Western Australia, between Southern Cross and Coolgardie.

**Habitat:**—Grows on yellow, sometimes gravelly, sand on flats or undulating terrain in heath dominated e.g. by *Grevillea*.

**Conservation status:**—National: Not listed. WA: Priority 2, possibly threatened or near-threatened but not yet adequately surveyed.

**Additional specimens examined:**—Approximate locality data given because the subspecies is rare. **WESTERN AUSTRALIA. Coolgardie:** Between Southern Cross and Coolgardie, 31°10'S, 120°10'E, *M.E. Phillips 696*, 9 September 1968 (CBG); W of Kalgoorlie, 31°00'S, 123°00'E, *T. Whaite 4077 & J. Whaite*, 8 September 1976 (NSW); between Yellowdine and Coolgardie, 31°20'S, 120°00'E, *M.D. Crisp 5586*, 30 January 1979 (CBG, PERTH); *ibid.*, *M.D. Crisp 5585*, 30 January 1979 (CBG, MEL); Coolgardie to Southern Cross, 31°10'S, 120°30'E, *M.D. Crisp 5593*, 31 January 1979 (CBG, K).

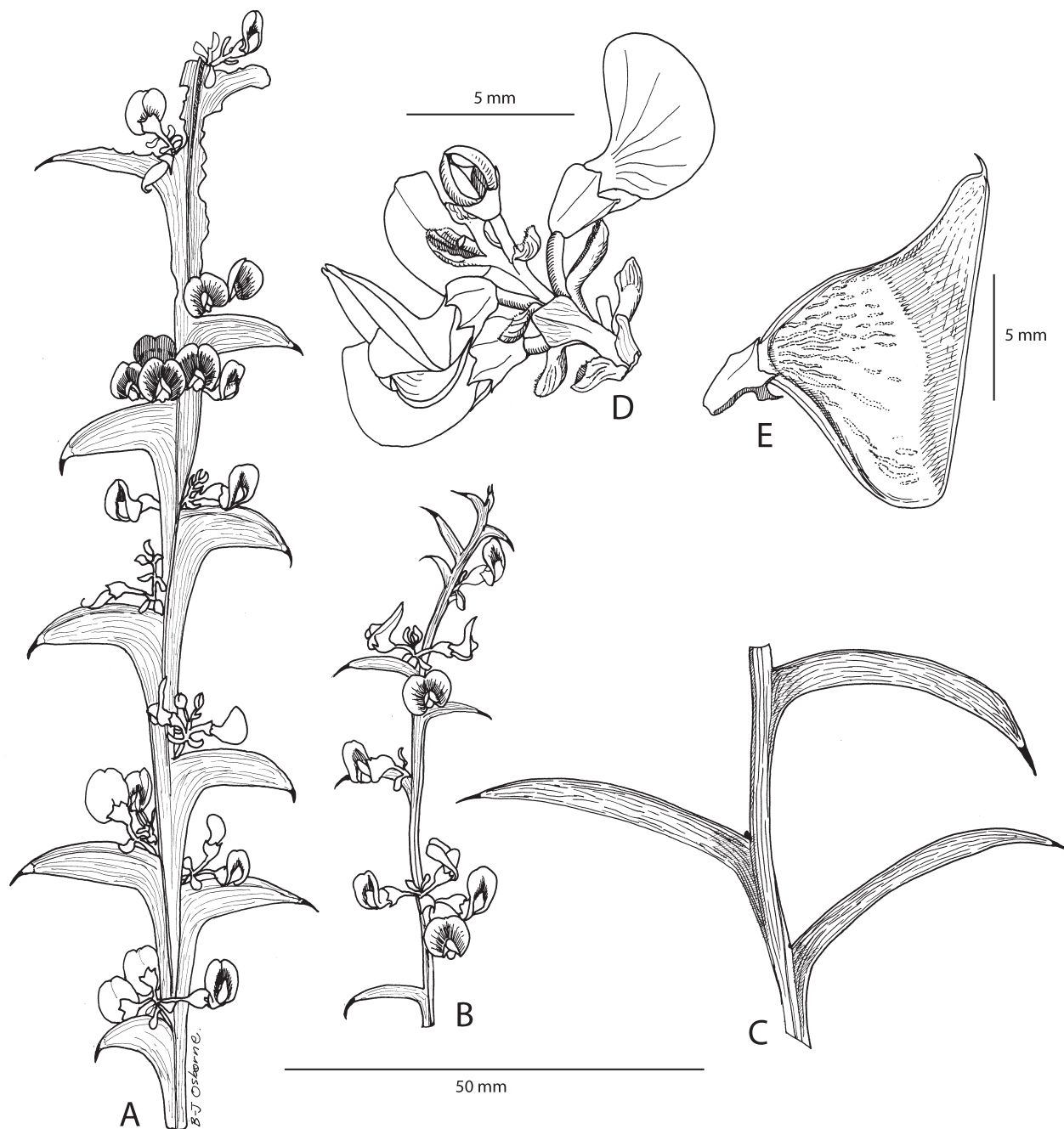
**Affinity:**—Differs from subsp. *sarissa* mainly in the bracts, which are not imbricate or concealing the inflorescence, are not prominently striate and are longer than in subsp. *sarissa* (subsp. *sarissa* 0.5–1.5 mm long). The flowers of subsp. *sarissa* are generally smaller (e.g. calyx ca. 2.5 mm long, standard ca. 5.5–6 mm broad).

**95. *Daviesia decurrens*** Meisner (1844: 52), Crisp (1987a: 250), Crisp (1995: 1187), Wheeler *et al.* (2002: 746). Type: 'In arenosis sylvae prope oppidum Perth, d. 22. Maj. 1839. Herb. Preiss. No. 1147a. (Drummond No. 234).' Lectotype (Crisp 1995): *Preiss 1147* (LD); isoelectotypes: BR, FI-W, G (3 sheets), GOET (2 sheets), K (2 sheets), MEL (5 sheets), NY (ex Herb. Meisn.), P (2 sheets), S, W (2 sheets). Syntype: *Drummond 234* (BM, ex Herb. Shuttleworth); isosyntypes: G (2 sheets), K (2 sheets), MEL, OXF, W (2 sheets)

*Daviesia prionodes* Meisner (1844: 52). *Daviesia pectinata* Lindl. var. *prionodes* (Meisn.) E.Pritz. in Diels & E. Pritzel (1904: 250). Type: 'In limoso-calculosis jugi montium Darlings'-range (Perth) d. 12. September 1839. Herb. Preiss. No. 1148. et in region. interior. Australiae occidentalis, d. 12. Mart. 1840. No. 1141. (Drummond No. 235.)'. Lectotype (Crisp 1995: 1187): *Drummond 235* (BM, ex Herb. Shuttleworth); isoelectotype: G (2 sheets), K (2 sheets), MEL, OXF, P (2 sheets), W (2 sheets). Syntype: *Preiss 1141* (LD, NY). Syntype: *Preiss 1148* (LD, NY); isosyntypes: G (2 sheets), MEL.

*Daviesia physodes* A.Cunn. ex Don (1832: 125) f. *gracilis* Meisner (1848: 213). Type: 'Swan River, Drummond coll. II. No. 105.' Holotype: BM (ex Herb. Shuttleworth); isotypes: G (2 sheets), K (3 sheets), LD, MEL, OXF, P, W.

*Daviesia hamata* Crisp (1995: 1198). Type: Western Australia, Avon, Quairading, 32°00'S, 117°24'E, *M.D. Crisp 6610*, 20 July 1980. Holotype: CBG; isotypes: L, NSW, PERTH.



**FIGURE 95.** *Daviesia decurrens* subsp. *decurrens*. A–C. Branchlets showing flowers and variation in vegetative morphology. D. Inflorescence. E. Pod. A from *Crisp 6655*; B from *Crisp 6458*; C from *Crisp 6459*; D. from *Crisp 6633*; E from *Koch 2218a*. Drawn by B-J. Osborne.

Spreading, erect or occasionally decumbent multi-stemmed *shrubs*, 0.3–1.8 m high and 0.5–1.5 m broad, glabrous, dull green or rarely glaucous. *Root anatomy* in both subspecies with anomalous secondary thickening (cord type), sometimes absent or developing late. *Branchlets* ascending, triquetrous to terete, lightly ribbed or (in subsp. *hamata*) striate. *Phyllodes* scattered, ascending to divaricate, narrowly triangular to subulate, often recurved-falcate, apex acute to acuminate, robustly pungent, vertically compressed or (in subsp. *hamata*) terete, inarticulate and decurrent with the branchlet, 2–45 mm long, 1–12 mm broad at the base, lightly ribbed when fresh, conspicuously striate when dry, very rigid in subsp. *hamata*. *Seedling phyllodes* leaf-like at the first node, second

node intermediate and nodes thereafter are adult-like phyllodes; leaf-like phyllodes narrowly obovate, rounded at the apex, with a petiole-like base, not pungent but with a small mucro, 35–40 × 6–8 mm; intermediate phyllodes linearly obovate, acute, becoming pungent, ca. 33 × 2.5 mm; adult-like phyllodes obovate, acute, pungent, becoming falcate, axis turned 90°, 21–26 × 3–3.5 mm. *Unit inflorescences* 1 per axil, racemose (cluster-like in subsp. *hamata*), 3–7-flowered; *peduncle* 0.5–1.5 mm long; *rachis* 0–2.5 mm long; *barren basal bracts* broadly oblong, striate, ca. 1 mm long; *subtending bracts* spatulate, striate, hooded, ca. 2.5 mm long. *Pedicel* 0.5–2 mm long. *Calyx* ventricose, 2–2.5 mm long including the 0.5 mm receptacle which is abruptly constricted to the pedicel, with 5 prominent ribs; upper 2 lobes very small, united higher than the lower 3, ca. 0.25 mm long; lower 3 lobes triangular, 0.5–1 mm long. *Corolla: standard* transversely elliptic or ovate, emarginate, 5–6 × 6–7 mm including the 1–2 mm claw, with 2 relatively large calli at the base, outer fringe yellow-pink with a large circular velvety red marking at centre; *wings* obovate, rounded and incurved at the apex to enclose the keel, auriculate, saccate, 4.5–7 × 1.6–2.5 mm including the 1–1.5 mm claw, red; *keel* half transversely obovate to elliptic, moderately incurved, acute, auriculate, saccate, 4–4.5 × 1.75–2 mm including the 1–1.5 mm claw, red, abaxially rugose. *Stamens* dimorphic: inner whorl of 5 with slightly longer, narrower filaments and smaller anthers; outer whorl of 5 with shorter filaments and larger anthers; all filaments (except vexillary) strongly compressed and lightly cohering; all anthers (except vexillary) basifixed and 2-celled; vexillary filament broad, channelled, clasping the ovary and style, flared into a pedestal at apex, with confluent thecae. *Pod* very broadly obtriangular with an acute apex that is sometimes rounded on the upper side, turgid, bluntly beaked, 8–13 × 8–10 mm; upper suture sigmoid; lower suture acute. *Seed* ovoid, sometimes with a slightly raised radicular lobe, compressed, 4–4.6 mm long, 2.5–2.8 mm broad, 1.5–2 mm thick, dark brown; *aril* 2.3–3 mm long. (Figs 95, 96).

**Flowering period:**—Mainly May to August, though occasionally flowering in October and November. *Fruiting period:* August to November.

**Distribution:**—Western Australia, throughout the south-west and eastern margins of the wheatbelt, from near Dongara south to Busselton and east to the Albany area, with a doubtful outlying record from near Coolgardie.

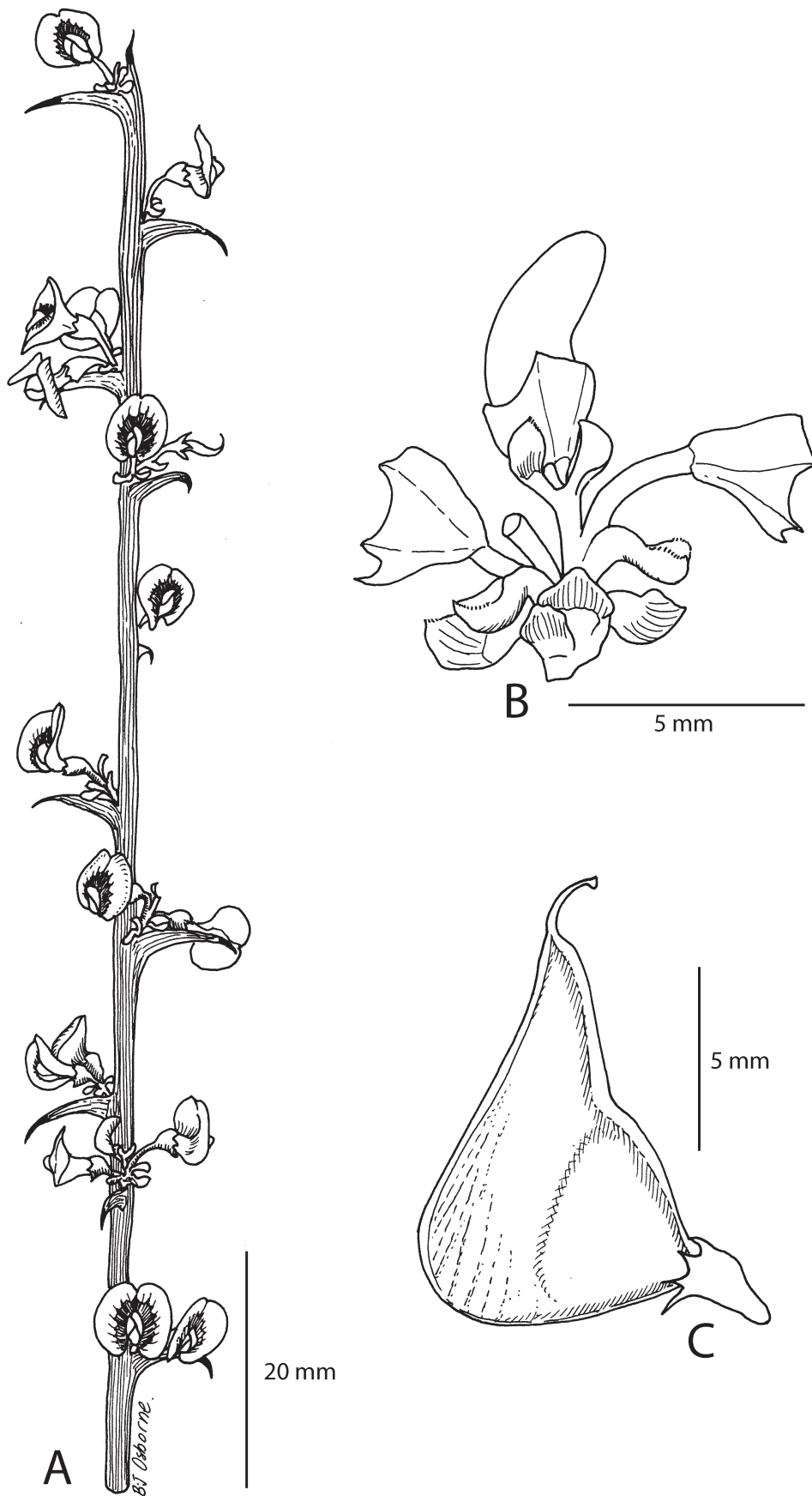
**Affinity:**—*Daviesia decurrens* is similar to *D. dilatata*, *D. pectinata* and *D. subulata*. *Daviesia decurrens* differs in the fresh state from *D. dilatata* by the striations and ridges along the phyllodes and branchlets. In particular, the decurrent phyllode-bases make the cross-section of the branchlets sharply triquetrous. When dry, *D. dilatata* is lightly striate, but neither ridged or ribbed, and the cross-section of the branchlets is bluntly trigonous (immediately below the phyllodes) or terete (lower down). The phyllodes of *D. decurrens* are not as frequently or strongly decurved as in *D. dilatata*. Striate bracts further distinguish *D. decurrens*.

*Daviesia pectinata* differs in having a much more prominent decurrent rib than *D. decurrens*. Also, in *D. pectinata* the bracts are not striate, the raceme-rachis is well developed (2–10 mm long), the calyx is campanulate without prominent ribs and the upper 2 calyx lobes are united into a truncate lip.

*Daviesia subulata* differs in having phyllodes that are never decurved. Also, in *D. subulata* the subtending bracts are much smaller (0.5–1 mm long), the calyx lobes are recurved and lack ribs, the standard lacks basal calli and the stamens are strongly dimorphic: the inner whorl of 5 has versatile anthers and confluent thecae.

*Daviesia decurrens* is closely related to *D. intricata*, which it resembles in its reproductive morphology, for example in the very small flowers with intense red markings, the rugose keel, the bizarre channelled vexillary filament and the somewhat turgid, bluntly beaked pod. Normally, *D. intricata* is easily distinguished by its divaricate, straight and very rigid phyllodes; however, plants with short phyllodes resemble *D. decurrens* subsp. *hamata*. Typical specimens of *D. intricata* have much longer phyllodes than subsp. *hamata* (10–40 mm or more) and the plants are divaricate and intricate due to the numerous spreading branchlets; also, the phyllodes are quite straight and all 5 inner stamens have confluent anthers. A few specimens from localities where these species are sympatric, e.g. around Quairading, appear intermediate (e.g. *Crisp* 6600, 6609, 6177 and 6178) while others appear typical of either *D. intricata* subsp. *intricata* (*Crisp* 6601) or *D. decurrens* subsp. *hamata* (*Crisp* 6608). This population merits further investigation.

**Infra-specific taxa:**—Populations in the southern and eastern Darling Range are intermediate between typical *D. decurrens* (which occurs mainly in jarrah-marri forest on the western side of the Darling Range, and on the coastal plain) and the taxon hitherto known as *D. hamata* (which occurs in the wheatbelt). Plants in the intermediate populations have upper phyllodes similar in size and shape to those of *D. hamata* but lower phyllodes larger and compressed as in *D. decurrens*. These linking populations are sufficiently frequent as to blur the distinction between *D. decurrens* and *D. hamata*, and therefore these two taxa are here reduced to subspecies of a single species. Examples are *M.D. Crisp* 5370 (CBG), *V. Crowley* DKN 250 and DKN 248 (PERTH), *G.J. Keighery* & *N. Gibson* 440 (PERTH), *G. Paull* 1580 (PERTH) and *C.E. Woolcock* D29 (CBG).



**FIGURE 96.** *Daviesia decurrens* subsp. *hamata*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6610* (type); C from *Crisp 6181*. Drawn by B.-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.



**Hybrids:**—*Daviesia decurrens* × *D. hakeoides*. A population on Mt Lesueur, NE of Jurien, Western Australia, appears to comprise segregating hybrids between *D. decurrens* subsp. *decurrens*, and *D. hakeoides* (R.E. Sokolowski 13, 14, 16–20, 22 and 23: CANB, PERTH). Some plants in this population resemble *D. decurrens* subsp. *hamata* in their phyllodes, but their bracts are large, as in *D. hakeoides*.

**95a. *Daviesia decurrens* Meisn. subsp. *decurrens***

*Daviesia prionodes* Meisner (1844: 52). *Daviesia pectinata* Lindl. var. *prionodes* (Meisn.) E.Pritz. in Diels & E. Pritzel (1904: 250). Type: 'In limoso-calculosis jugi montium Darlings'-range (Perth) d. 12. September 1839. Herb. Preiss. No. 1148. et in region. interior. Australiae occidentalis, d. 12. Mart. 1840. No. 1141. (Drummond No. 235.)'. Lectotype (Crisp 1995: 1187): *Drummond 235* (BM, ex Herb. Shuttleworth); isolectotype: G (2 sheets), K (2 sheets), MEL, OXF, P (2 sheets), W (2 sheets). Syntype: *Preiss 1141* (LD, NY). Syntype: *Preiss 1148* (LD, NY); isosyntypes: G (2 sheets), MEL.

*Daviesia physodes* A.Cunn. ex Don (1832: 125) f. *gracilis* Meisner (1848: 213). Type: 'Swan River, Drummond coll. II. No. 105.' Holotype: BM (ex Herb. Shuttleworth); isotypes: G (2 sheets), K (3 sheets), LD, MEL, OXF, P, W.

Differs from subsp. *hamata* in having much longer (to 45 mm), broader (to 12 mm), vertically compressed, strongly decurrent phyllodes and ridged, trigonous branchlets. (Fig. 95).

**Distribution:**—Western Australia, from Three Springs south to Nannup and King George Sound. A single collection from Coolgardie, much farther inland, is a doubtful record because the locality is stamped on the label rather than written and is well within the range of subsp. *hamata*.

**Habitat:**—Grows in laterite-derived sandy, clayey and gravelly soils on flats, mostly in jarrah-marri forest or eucalypt woodland, though occasionally in *Banksia* woodland or *Melaleuca* swamp.

**Selected specimens (190 examined):**—**WESTERN AUSTRALIA. Irwin:** 18 km NW of Moora, 30°33'S, 115°49'E, *C. Chapman (18)78*, 30 July 1978 (CBG, MEL, PERTH); 8 km S of Eneabba, 29°53'S, 115°15'E, *E.A. Griffin 888*, 10 July 1977 (PERTH); 25 km S of Rail crossing on Eneabba S Road, 30°01'S, 115°13'E, *C. Chapman (62)77*, 25 August 1977 (CBG); Mt Lesueur, NE of Jurien, 30°11'S, 115°12'E, *R.E.S. Sokolowski 13*, 22 June 1984 (CANB, PERTH). **Darling:** 56 km N of Muchea along Brand Highway, 31°07'S, 115°43'E, *M.D. Crisp 6458–9*, 15 July 1980 (CBG); Darling Range, 2 km NE of Great Northern Highway, from 22 km N of Bullsbrook, 31°30'S, 116°03'E, *M.D. Crisp 6633*, 21 July 1980 (AD, CBG, PERTH); 58 km SE of Kelmscott along Brookton Highway, 32°17'S, 116°33'E, *M.D. Crisp 6655–6*, 22 July 1980 (CBG, MEL); Lowden, ca. 33°32'S, 115°58'E, *M. Koch 2218*, September 1914 (PERTH 05196043); Donnybrook, 33°35'S, 115°49'E, *C.E. Woolcock D69*, 25 July 1981 (CBG); Mundaring Weir Road, south side of reservoir, 32°00'S, 116°10'E, *M.G. Corrick 9190 & J.H. Ross*, 5 October 1984 (CANB, HO, MEL); Mundaring Weir, 31°57'S, 116°10'E, *C.A. Gardner 539*, 10 July 1920 (PERTH); 41 km NW of North Bannister along Albany Highway, 32°17'S, 116°12'E, *J. Taylor 2141 & P. Ollerenshaw*, 22 September 1983 (CBG, MEL); Canning Vale, 20 km SE of Perth, 32°08'S, 116°03'E, *D. Mayrhofer 4*, 3 August 1984 (CBG); N of Perth on Geraldton Highway, ca. 31°30'S, 116°00'E, *C. Chapman (88B)77*, 27 September 1977 (CBG); between Darkan and Collie, ca. 33°25'S, 116°30'E, *C.E. Woolcock D29*, 22 July 1981 (CBG); Darlington, Darling Range, 31°55'S, 116°04'E, *A. Morrison s.n.*, 24 June 1899 (CANB 336571, PERTH); 20 km N of Boddington, Bannister Hill, 32°38'S, 116°29'E, *M.D. Crisp 5390*, 22 January 1979, seedling (CBG). **Avon:** Between Narrogin and Wagin, *C.E. Woolcock D70*, 22 July 1981 (CBG); sources of the Swan River, *E. Merrall s.n.*, (MEL 81257). **Roe:** 50 km S of Mayanup towards Cranbrook, *G.J. Keighery 29*, 10 May 1974 (PERTH). **Coolgardie:** Coolgardie, 30°57'S, 121°09'E, *L.G. Webster s.n.*, 1899 (NSW)—record doubtful (see above).

**95b. *Daviesia decurrens* Meisn. subsp. *hamata* (Crisp) Crisp & G.Chandler, *comb. et stat. nov.***

Basionym: *Daviesia hamata* Crisp (1995: 1198). Type: Western Australia, Avon, Quairading, 32°00'S, 117°24'E, *M.D. Crisp 6610*, 20 July 1980. Holotype: CBG; isotypes: L, NSW, PERTH.

Differs from subsp. *decurrens* in having shorter (to 15 mm), narrower (to 2 mm), terete, rigid, scarcely decurrent phyllodes and striate (*in vivo*), terete branchlets. (Fig. 96).

**Distribution:**—Western Australia, from Marchagee south to Brookton and east to Gnarlbine, south of Coolgardie. Occurring farther inland than the typical subspecies.

**Habitat:**—Grows in sand to clayey sand on undulating to flat terrain to granite outcrops, in low to tall heathland dominated by genera such as *Allocasuarina* and *Acacia*.

**Selected specimens (21 examined):**—WESTERN AUSTRALIA. **Irwin:** 7 km S of Marchagee, 30°07'S, 116°03'E, *M.D. Crisp 6492*, 16 July 1980 (CBG, K, PERTH). **Avon:** 3 km SW of Quairading, 32°01'S, 117°22'E, *M.D. Crisp 6181*, 27 September 1979 (CBG); Wattengutten Hill, 27.5 km ESE of Wongan Hills town, 30°58'S, 116°59'E, *M.D. Crisp 6678*, 23 July 1980 (AD, CBG); Tammin, 31°38'S, 117°29'E, *C.A. Gardner 12441*, 16 July 1960 (PERTH); Brookton, 32°22'S, 117°00'E, *C.E. Woolcock D85*, 21 July 1981 (CBG). **Coolgardie:** Near Gnarlbine, 31°09'S, 120°57'E, *R. Helms s.n.*, 12 November 1891 (MEL 0072483A, PERTH 5188946).

**96. *Daviesia intricata*** Crisp (1995: 1204). Type: Western Australia, Avon, 24 km E of Pingelly, Tutanning Reserve, 32°33'S, 117°20'E, *M.D. Crisp 6670*, 22 July 1980. Holotype: CBG; isotypes: AD, K, L, NSW, PERTH

Dense, intricate *shrubs* to 2 m high, glabrous, glaucescent. *Root anatomy* in both subspecies with anomalous secondary thickening (cord type). *Branchlets* scattered, divaricate or erect, slightly to strongly flexuose, terete, striate, rigid. *Phyllodes* usually developed only on upper portion of branchlets, reduced to scales below, spreading at ca. 90° or retrorse, terete (subsp. *intricata*) or subulate and vertically compressed or flattened (subsp. *xiphophylla*), apex acicular or acuminate, strongly pungent, base inarticulate but scarcely decurrent, mostly 20–40 mm long, 1.5–2 mm diam. at base when terete, to 4 mm broad when compressed, striate when dry, very rigid. *Unit inflorescences* 1 per axil, very condensed racemes, cluster-like, 3–7-flowered; *peduncle* 0.5–1 mm long; *rachis* 1–5 mm long; *barren basal bracts* oblong, very small (ca. 0.5 mm long or less); *subtending bracts* widely spreading, spatulate, with margins incurved, 1.5–2 mm long, keeled but not striate. *Pedicel* 1–3 mm long. *Calyx* ventricose, 1.5–2.5 mm long including ca. 0.5 mm receptacle; lobes subequal, acuminate, lower 3 longer than upper 2, up to 0.5 mm long. *Corolla: standard* transversely elliptic, emarginate, cordate, 4.5–5.5 × 5–7 mm including the 0.75–1 mm claw, with 2 calli either side of the central channel, red-black at centre with a narrow apricot-yellow margin; *wings* elliptic to obovate, rounded, incurved and overlapping at apex to enclose keel, auriculate, slightly saccate, 4.5–5 × 2–2.5 mm including the 1–1.5 mm claw, dark red; *keel* half transversely elliptic, constricted to a beak, auriculate, saccate, 4–5 × ca. 1.75 mm including the 1–1.5 mm claw, rugose, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer, terete filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, compressed filaments and oblong, basifixed, 2-celled anthers; filaments free; vexillary filament channelled, embracing gynoecium, flared at apex. *Pod* obliquely very broadly obtriangular, constricted to a rather blunt beak, slightly turgid, 7–10 × 6–8 mm, thick-walled; upper suture sigmoid; lower suture acute. *Seed* not seen. (Fig. 97).

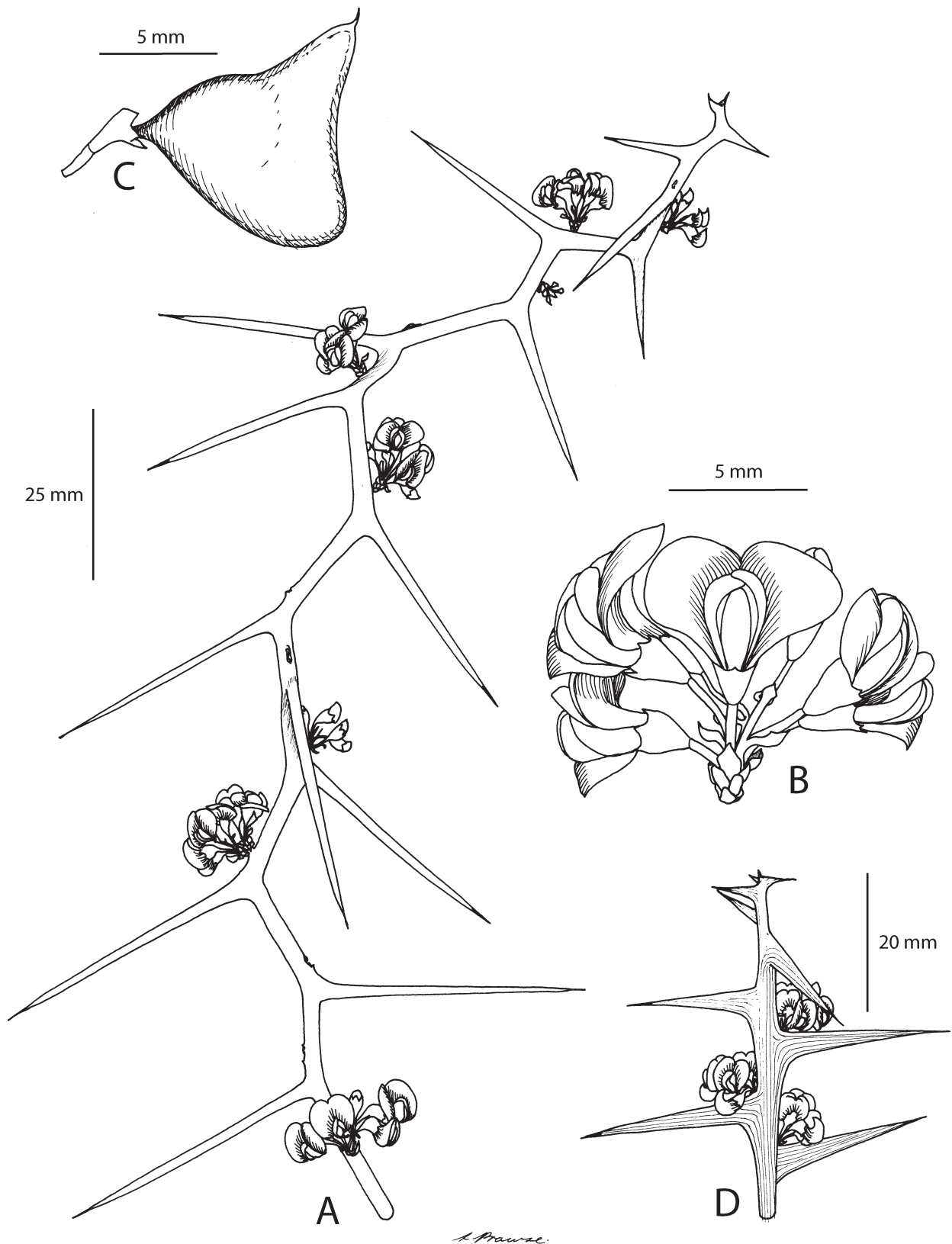
**Flowering period:**—May to August. *Fruiting period:* July to October.

**Distribution:**—Western Australia, central and southern wheatbelt, from the Charles Gardner Reserve (near Tammin) south to Dumbleyung, south-east to Ravensthorpe, and east to the Southern Cross–Marble Rocks area. The subspecies are allopatric, with subsp. *xiphophylla* occurring farther inland.

**Affinity:**—This species is closely related to *D. decurrens* and *D. sarissa*. *Daviesia decurrens* subsp. *decurrens* can usually be distinguished by the consistent development of phyllodes at lower nodes, and by the branchlets being triquetrous with decurrent ridges from the phyllode bases. In *D. decurrens* subsp. *hamata*, the phyllodes are usually much shorter than in *D. intricata* (mostly < 12 mm long), as well as being recurved, at least at the apex. Both subspecies of *D. decurrens* differ from *D. intricata* in having the anther thecae confluent only in the vexillary stamen. Populations of both *D. decurrens* subsp. *hamata* and *D. intricata* subsp. *intricata* occur sympatrically at some localities in the wheatbelt, e.g. around Quairading, and include apparent intermediates between these taxa. For details, see discussion under *D. decurrens*.

*Daviesia sarissa* is vegetatively similar to *D. intricata* subsp. *intricata* but differs in having smooth (non-striate) phyllodes and branchlets, as well as imbricate bracts enclosing the inflorescence. *Daviesia rhizomata* also is vegetatively similar, but has different floral morphology, for example, the vexillary filament is terete and does not differ from the others of the inner whorl, the flowers are larger (calyx 4–5 mm long, standard 7–9 mm broad), the wings do not enclose the keel and the keel is very acute with involute margins.

**Infra-specific taxa:**—Two subspecies have been recognised within *D. intricata* on the basis of their differing vegetative morphology. Nevertheless, it is clear that these are very closely related, and the presence of the occasional compressed phyllode on the typical subspecies indicates that its terete phyllodes are not as differentiated from the dagger-like phyllodes of subsp. *xiphophylla* as it first appears.



**FIGURE 97.** *Daviesia intricata* subsp. *intricata*. A. Flowering branchlet. B. Inflorescence. C. Pod. *Daviesia intricata* subsp. *xiphophylla*. D. Flowering branchlet. A from Crisp 6670 (type); B from Crisp 6599; C from Drummond s.n. (MEL 72497); D from Crisp 6562 (type). Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**96a. *Daviesia intricata* Crisp subsp. *intricata***

Reference: Crisp (1995: 1205).

Plants large (to 2 m high) and hummocky, very intricate due to the divaricate branching. *Branchlets* slightly to strongly flexuose, sometimes arching. *Phyllodes* terete or some slightly vertically compressed. *Corolla: standard* ca.  $5.5 \times 6.5$ –7 mm including the 0.75–1 mm claw; *wings* ca.  $4.5 \times 2.2$ –2.5 mm including the 1 mm claw. *Pod* 9–10  $\times$  7.5–8 mm. (Fig. 97A–C).

**Flowering period:**—June to August. *Fruiting period:* September and October.

**Distribution:**—Western Australia, from the Charles Gardner Reserve (near Tammin) south to Dumbleyung and south-east to Ravensthorpe.

**Habitat:**—On yellow or brownish, sometimes clayey, sand, occasionally with outcropping laterite, gravelly laterite and gravelly sandy loam, on undulating to flat terrain, in eucalypt woodland or mallee, low, shrubby heathland, or tall shrubland, with a large variety of understorey species.

**Selected specimens (30 examined):**—**WESTERN AUSTRALIA. Avon:** Quairading, town limit on road to Tammin, 32°00'S, 117°24'E, *M.D. Crisp 6609*, 20 July 1980 (CBG, PERTH); Dongolocking Reserve, ca. 48 km E of Narrogin, 13 km SSE of Toolibin, 33°00'S, 117°44'E, *B.G. Muir 19(1.4)*, 11–12 August 1976 (PERTH); 17 km S of Tammin, C.A. Gardner Reserve, 1.5 km NW of SE corner, 31°48'S, 117°30'E, *M.D. Crisp 6599*, 20 July 1980 (CBG, K, L, MEL, NSW, PERTH). **Roe:** 7 km from Dudinin along road to Kulin, 32°49'S, 117°57'E, *M.D. Crisp 6161, et al.*, 26 September 1979 (CBG, PERTH); Boxwood Hills–Toompup road, 30 km NW of Chillilup Pool turn-off, 34°07'S, 118°29'E, *M.D. Crisp 6139, et al.*, 25 September 1979 (CBG, PERTH). **Darling:** Kojonup Loc 7260, ca. 33°50'S, 117°10'E, *V.F. McDougall 4*, 1 August 1955 (PERTH).

**Affinity:**—Subsp. *xiphophylla* differs in having a smaller stature (generally 0.5 m high), non-intertwining branchlets, phyllodes that are vertically compressed and never terete, smaller flowers (e.g. standard  $4.5$ – $5 \times 5$  mm), and smaller pods ( $7$ – $8 \times 6$ – $7$  mm).

**96b. *Daviesia intricata* Crisp subsp. *xiphophylla* Crisp (1995: 1205).** Type: Western Australia, Coolgardie, 18 km E of Southern Cross along Great Eastern Hwy, 31°16'S, 119°30'E, *M.D. Crisp 6562*, 19 July 1980. Holotype: CBG; isotypes: AD, CANB, K, L, MEL, NSW, PERTH

Plants small, usually ca. 0.5 m high. *Branchlets*  $\pm$  erect and not intertwining. *Phyllodes* strongly vertically compressed, subulate and dagger-like. *Corolla: standard* ca.  $4.5$ – $5 \times 5$  mm including the 1 mm claw; *wings* ca.  $4.5$ – $5 \times 2$  mm including the 1.5 mm claw. *Pod*  $7$ – $8 \times 6$ – $7$  mm. (Fig. 97D).

**Flowering period:**—May to August. *Fruiting period:* July and August.

**Distribution:**—Western Australia, from east of Southern Cross south to Marble Rocks.

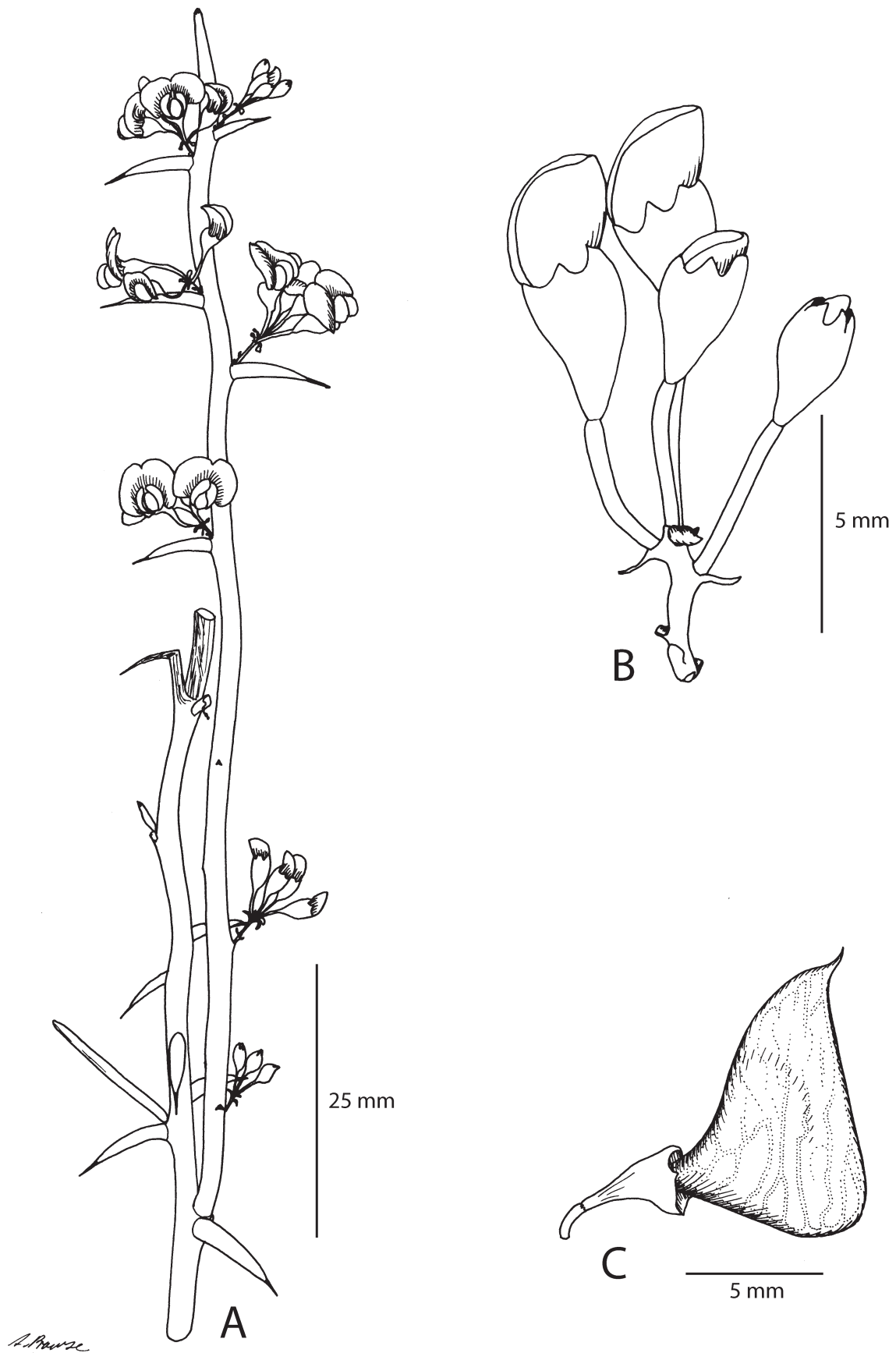
**Habitat:**—Grows in yellowish sand (often gravelly) on low rises and low ridges in undulating sandplains, in heathland or mallee eucalypt scrub, with *Acacia*, *Allocasuarina*, *Grevillea* and *Hakea*.

**Additional specimens examined:**—**WESTERN AUSTRALIA. Avon:** 28 km S of Bodallin, 31°37'S, 118°51'E, *B.H. Smith 590*, 14 July 1985 (CBG, HO, MEL, NSW, PERTH). **Coolgardie:** Ghooli repeater station, 31°19'S, 119°28'E, *L.A. Craven 5403, et al.*, 7 May 1978 (CANB, CBG); Ghooli Hill, ca. 20 km E of Southern Cross, near microwave station GHO, 31°17'S, 119°30'E, *M.D. Crisp 1109*, 17 August 1975 (CBG); Bronti[e Station], 30°56'S, 119°30'E, *E. Salisbury s.n.*, 7 August 1949 (K, PERTH 5481341); 18 km E of Southern Cross along Great Eastern Highway, 31°16'S, 119°30'E, *M.D. Crisp 6563*, 19 July 1980 (CBG, MEL). **Roe:** Ca. 55 km E of Hyden, 3 km NE of Marble Rocks, 32°30'S, 119°26'E, *M.D. Crisp 5550*, 29 January 1979 (CBG).

**Affinity:**—Subsp. *intricata* differs in being a larger plant (up to 2 m high) with intertwining branchlets, phyllodes that are mostly terete, larger flowers (e.g. standard  $5.5 \times 6.5$ –7 mm) and larger pods ( $9$ – $10 \times 7.5$ –8 mm).

**VII.e. *D. incrassata* Clade**

**97. *Daviesia retrorsa* Crisp (1995: 1228).** Type: Western Australia, Roe, main Balladonia–Esperance track, near turn-off to Mt Ragged, *M.A. Clements 2051*, 17 August 1980. Holotype: CBG; isotypes: K, MEL, PERTH



**FIGURE 98.** *Daviesia retrorsa*. A. Flowering branchlet. B. Inflorescence in bud. C. Pod. A, B from *Clements 2051* (type); C from *Crisp 4859*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Dense, hummocky, intricate *shrubs*, to 1.6 m high and 3 m broad; branchlets and phyllodes glabrous, smooth when fresh, lightly ribbed or wrinkled when dry, dull green or glaucescent. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending or tangled, often gently sinuous, tending to flexuose when juvenile, terete. *Phyllodes* scattered, sometimes very few present and only near branchlet apex, spreading at ca. 90° or retrorse, terete, tapered gently from the articulate base to the acicular, pungent apex, 5–50 mm long, 1–1.5 mm diam. *Seedling phyllodes* narrowly obovate for the first 7 or 8 nodes before grading into terete phyllodes over the next 2–4 nodes; those at lower 7 or 8 nodes with a petiole-like base, prominent reticulate venation, mucronate, 16–30 × 1.5–3.5 mm; upper juvenile phyllodes to 35 × 0.5 mm, terete, mucronate. *Unit inflorescences* 1 per axil, racemose, 2–5-flowered; *peduncle* 1–7 mm long; *rachis* 0.5–6 mm long; *subtending bracts* spreading to ascending, oblong, keeled, ca. 1 mm long. *Pedicels* 3–6 mm long. *Calyx* 3.5–4 mm long including the ca. 1.5 mm receptacle; lobes ca. 0.75 mm long; upper 2 lobes united into a truncate lip; lower 3 lobes triangular, recurving just below the lobes. *Corolla: standard* depressed-ovate, emarginate, 6–6.5 × 7.5–9 mm including the ca. 1.5 mm claw, orange-yellow with a red central ring around a yellow centre; *wings* spatulate, apically rounded and incurved but not overlapping, auriculate, ca. 5–5.5 × 3 mm including the 1.5 mm claw, light red; *keel* half transversely elliptic, acute to slightly obtuse, neither incurved nor beaked, auriculate, saccate, ca. 4.5–5 × 2 mm including the 1.5 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and oblong, basifixed, 2-celled anthers; filaments all compressed, free. *Pod* obliquely shallowly obtriangular, acuminate, somewhat turgid, 9–11 × 6–7 mm, thick-walled; upper suture strongly sigmoid; lower suture acute and very broadly rounded. *Seed* obloid to ± globose, 3.5–4 mm long, 2.5–3 mm broad, 2–2.5 mm thick, brown to black with brown mottling; *aril* ca. 2–2.3 mm long. (Fig. 98).

**Flowering period:**—August to November. *Fruiting period:* August to November.

**Distribution:**—Western Australia, along the south coast from Hopetoun east to the track from Cocklebidy to Twilight Cove on the Great Australian Bight.

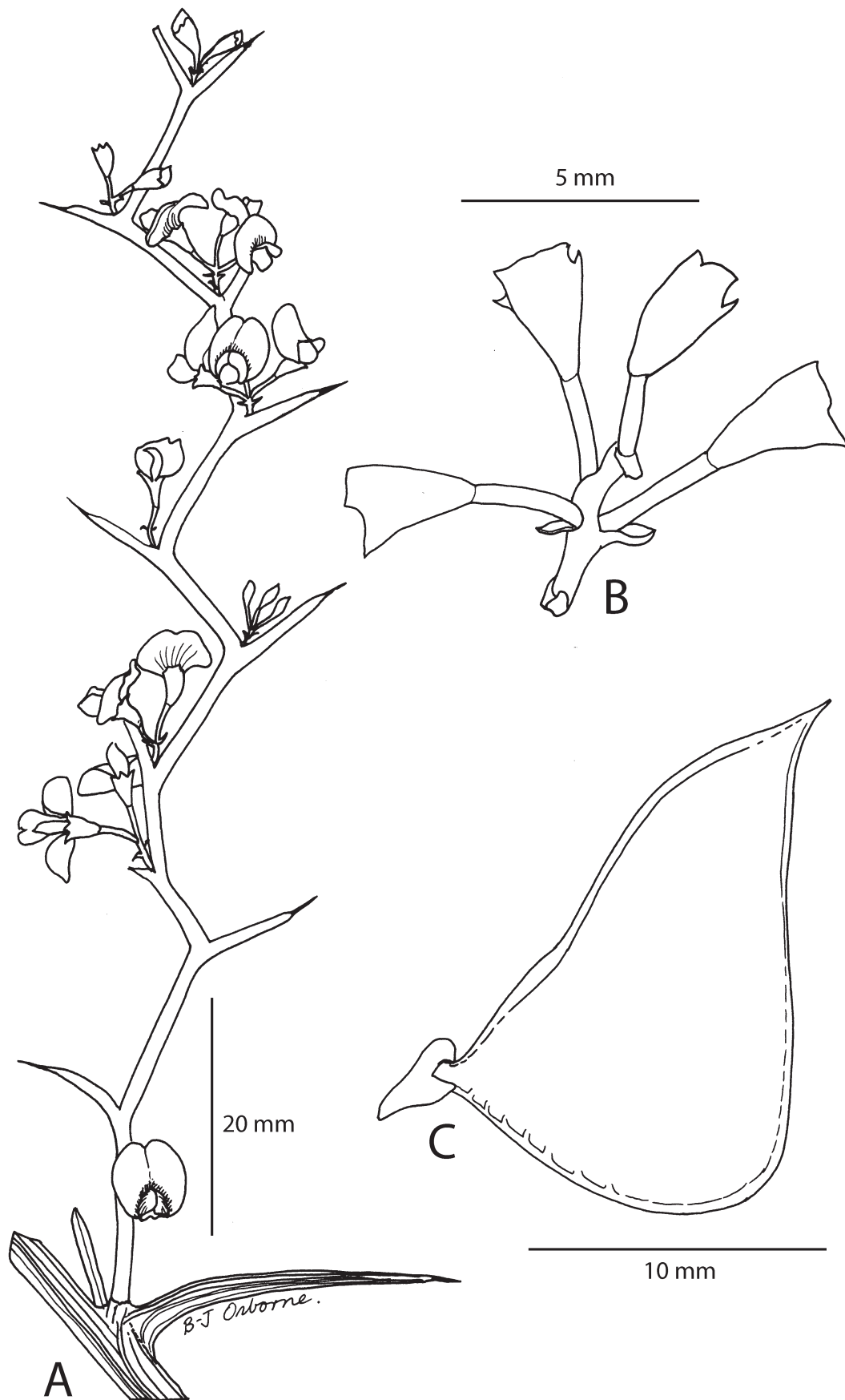
**Habitat:**—White sand over limestone, on dunefields or rocky outcrops, in eucalypt mallee-heath or *Acacia* heath.

**Selected specimens (20 examined):**—WESTERN AUSTRALIA. **Eyre:** Cape Arid National Park, 33 km WNW of Israelite Bay, 33°32'S, 123°31'E, *R. Borough 3*, 1 September 1978 (CBG); 12 km from Mt Ragged (Tower Peak) Range along road to Israelite Bay, 33°33'S, 123°31'E, *M.D. Crisp 4859*, 6 January 1979 (CBG, MEL); Cape Arid National Park, E of Esperance, *R.D. Royce 10136*, 5 December 1971 (PERTH); 7 km from Esperance along road to Ravensthorpe, 33°46'S, 121°50'E, *J. Taylor 1614 & P. Ollerenshaw*, 10 September 1983 (CBG, MEL). **Eucla:** 20 km SSW of Cocklebidy along track to Twilight Cove, 32°12'S, 126°04'E, *M.D. Crisp 4772*, 4 January 1979 (CBG, K, MEL, PERTH). **CULTIVATED.** Australian National Botanic Gardens, ex. 20 km SSW of Cocklebidy, *M.D. Crisp s.n.*, 14 March 1980 (CBG 8003594).

**Affinity:**—*Daviesia retrorsa* clusters weakly with the *D. incrassata* group (Fig. 1B), with which it shares a distinctive calyx and turgid pod; however, the keel is neither sharply incurved nor beaked, and the stamens are strongly dimorphic. Vegetatively it is similar to several species in the genus (see under *D. ramosissima*), such as *D. brachyphylla*, *D. ramosissima*, *D. incrassata* subsp. *reversifolia* and especially *D. aphylla*. The last taxon has the phyllodes reduced similarly to some plants of *D. retrorsa*, but differs in having the phyllodes continuous with the branchlets, and in having compressed, thin-walled pods. Also, the flowers of *D. benthamii* are smaller, e.g. the standard is 5–6 mm broad. All of *D. brachyphylla*, *D. incrassata* subsp. *reversifolia* and *D. ramosissima* have larger (> 10 mm long), more turgid pods, an incurved beaked keel, and phyllodes fully developed at virtually all nodes, if sometimes small (*D. brachyphylla*). *Daviesia incrassata* subsp. *reversifolia* also has phyllodes that are continuous with the branchlets.

**98. *Daviesia flexuosa*** Bentham (1837a: 75), Bentham (1864: 86), Wheeler *et al.* (2002: 746). Type: 'King Georges Sound. Huegel.' Holotype: W

Spreading *shrubs*, to 2.5 m high, glabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* regularly flexuose with a phyllode at each bend, terete to triquetrous, ribbed when dry, ascending to branching at ca. 45°. *Phyllodes* scattered, narrowly triangular or subulate, flattened vertically or terete, occasionally slightly recurved, apically acuminate, pungent, inarticulate and decurrent at base, 5–43(–65) mm long, 1–2(–3) mm



**FIGURE 99.** *Daviesia flexuosa*. A. Flowering branchlet. B. Inflorescence showing flowers with calyces only. C. Pod. A from *Green 4712*; B from *Crisp 5077*; C from *Maiden s.n. (NSW 34759)*. Drawn by B-J. Osborne.

wide at base, ribbed when dry. *Juvenile phyllodes* sometimes with a dilated-lobed upper margin near the tip. *Seedling phyllodes* opposite (though the branchlets are not flexuose), much larger at the base (up to 22 mm long) than further up the seedling (may be as short as 1.5 mm), 1–2 mm broad at base. *Unit inflorescences* reduced racemes, sometimes appearing umbellate, 2–4-flowered; *peduncle* 1–2 mm long; *rachis* from almost nil to 1 mm long; *subtending bracts* oblong, recurved, to ca. 1 mm long. *Pedicels* 1.5–3 mm long. *Calyx* 3–4 mm long including the 0.75–1.5 mm receptacle, tapering evenly to the pedicel; upper 2 lobes united into a broad, truncate lip that is not emarginate, ca. 0.75 mm long; lower 3 lobes triangular, ca. 0.25 mm long. *Corolla: standard* very broadly ovate, emarginate, 7.5–9 × 7–9 mm including the 1.5–2 mm claw, occasionally with 2 small calli at the base of the lamina, outer half yellow, inner half red; *wings* obliquely obovate with a rounded, incurved apex, auriculate, slightly saccate, 6–6.5 × 2.5–3.25 mm including the ca. 1.5 mm claw, red, often fading at apex; *keel* half very broadly obovate, acute, auriculate, saccate, 5–5.5 × 1.75–2 mm including the ca. 1.5 mm claw, red. *Stamens* strongly dimorphic: inner whorl of 5 with slightly longer, narrower, ca. terete filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with slightly shorter, broader, compressed filaments and longer, oblong, basifixed, 2-celled anthers; vexillary stamen with the filament becoming very broad towards the apex; filaments all cohering. *Pods* obliquely shallowly obtriangular, acute, compressed, 17–22 × 9–11 mm, thin-walled, purple-spotted; upper suture strongly sigmoid; lower suture acute. *Seed* compressed-obovoid, ca. 4 mm long, 2 mm broad, 1.5 mm thick, olive-coloured; *aril* ca. 3 mm long. (Fig. 99).

**Flowering period:**—July to September. *Fruiting period:* August to November.

**Distribution:**—Western Australia, mostly near the coast in the far south-west, from Cape Naturaliste eastward to Mt Manypeaks.

**Habitat:**—Occurs in (usually deep) sandy soil over laterite on open flats to undulating country in open forest dominated by *Eucalyptus marginata* and *Corymbia calophylla* and a mixed understorey vegetation or heathland with eucalypts such as *E. staeri* emergent.

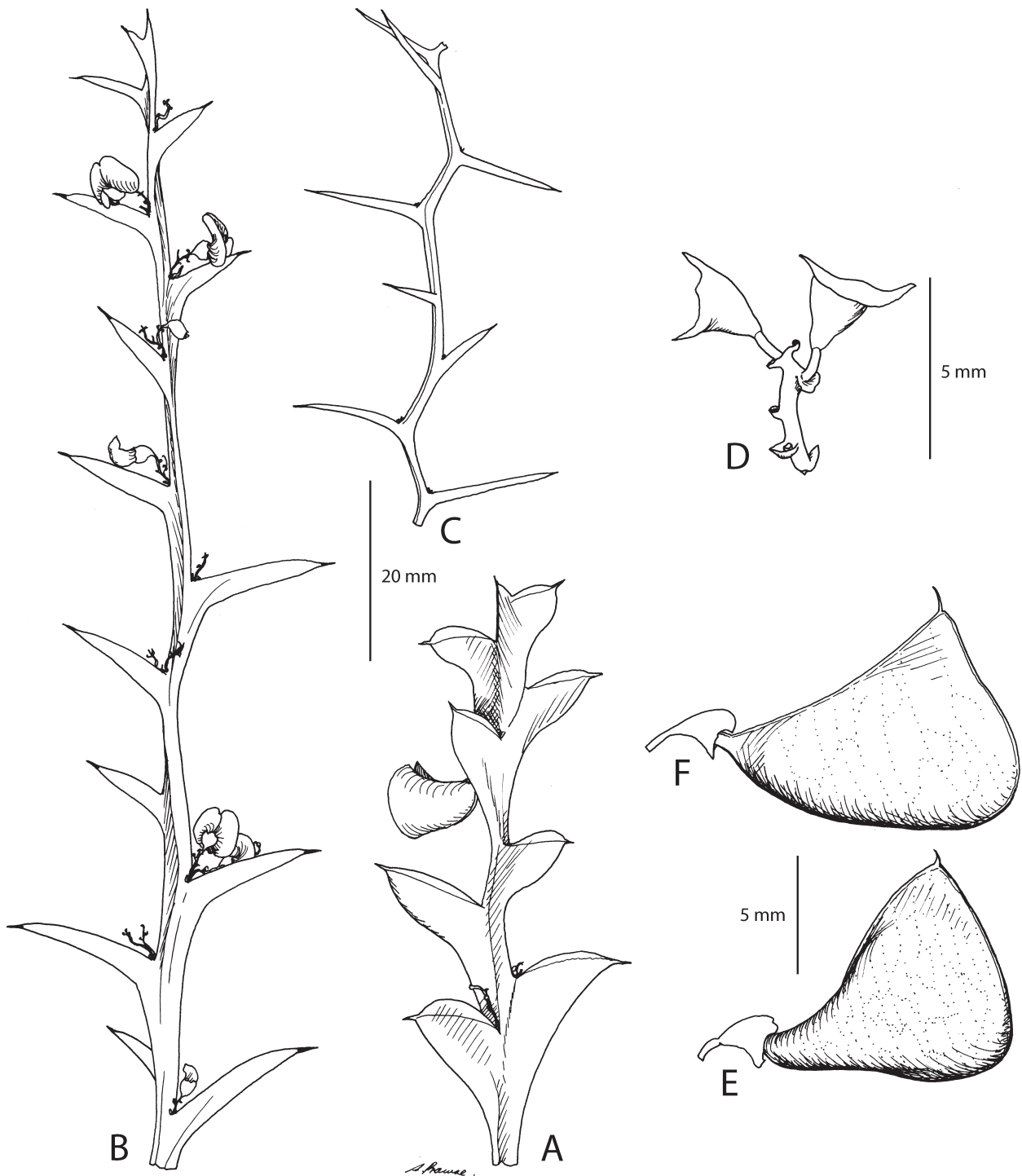
**Selected specimens (64 examined):**—WESTERN AUSTRALIA. **Darling:** Albany, 35°00'S, 117°52'E, C.E. Woolcock D42, 30 July 1981 (CBG); 8 km E of Denmark, 34°58'S, 117°28'E, J.W. Green 4712, 14 August 1978 (CANB, PERTH); Scott River National Park, ca. 12 km ENE of Augusta (at mouth of Blackwood River), 34°20'S, 115°09'E, N.G. Walsh 1064, 20 August 1982 (CANB, MEL); King George's Sound, 35°03'S, 117°58'E, J.H. Maiden s.n., November 1909 (NSW 34759); Eyre: 9.5 km S of Mount Barker, 34°43'S, 117°42'E, R.D. Royce 4236, 29 July 1953 (CANB, PERTH); Marbellup Reserve, 34°59'S, 117°43'E, J.W. Green 4880, 25 August 1978 (CANB, PERTH); ca. 50 km along Highway 1 from Albany to Jerramungup, 0.5 km SW of Cheyne Beach turn-off, 34°49'S, 118°15'E, M.D. Crisp 5077, 13 January 1979 (CBG).

**Affinity:**—*Daviesia flexuosa* is similar to *D. decipiens*, which also has flexuose branchlets. *Daviesia decipiens* has a truncate receptacle, and the pods are turgid, smaller (11–12 mm long) and uniformly red-brown or purplish.

**99. *Daviesia decipiens*** (E.Pritz.) Crisp (1995: 1185). *Daviesia pectinata* Lindl. in Mitchell (1838: 150) var. *decipiens* E.Pritz. in Diels & E. Pritzel (1904: 250). Type: 'Hab. in distr. Eyre pr. Philipps Riv. (D. 3488)' (B†). The type is missing, presumably destroyed in the Berlin herbarium during the Second World War (Hiepko 1987). Neotype (Crisp 1995: 1185): Western Australia, 3 km WNW of Cape Riche, 34°36'S, 118°45'E, M.D. Crisp 5104, 14 Jan 1979 (CBG); isoneotype: K, PERTH

Variable, intricate *shrubs*, to 1.8 m high, glabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* flexuose, triquetrous, broadly to narrowly winged or ribbed with decurrent phyllode-bases, 1.5–10 mm broad. *Phyllodes* scattered, spreading or somewhat recurved, vertically compressed to dilated, oblong or deltoid or subulate, tapered to the acuminate apex, pungent, with a broad, decurrent base (rarely not apparent), 5–25 mm long, (1)2–8 mm broad at the base, with a single nerve near the upper margin, smooth when fresh and wrinkled when dry. *Unit inflorescences* 1 per axil, racemose, 1 or 2(3)-flowered; *peduncle* flexuose, 1–2.5 mm long; *rachis* flexuose, 0.5–2 mm long; *subtending bracts* ascending, oblong to rhombic, keeled, decurrent with rachis or peduncle, to 0.5 mm long. *Pedicels* 0.75–1.5 mm long. *Calyx* 3–4 mm long including the ca. 0.5–1.75 mm receptacle, truncate at base; lobes very broad and short; upper 2 lobes united into a broad, truncate lip, ca. 0.75 mm long; lower 3 lobes triangular, flared from just below lobes, ca. 0.25 mm long; receptacle greater in diameter than pedicel. *Corolla: standard* transversely elliptic to broadly so, emarginate, 5–6.5 × 5.5–8 mm including the 1.5–2 mm claw, with 2 small calli just above the base of the lamina, orange with maroon markings; *wings* obovate with





**FIGURE 100.** *Daviesia decipiens*. A–C. Branchlets showing variation in vegetative parts. D. Unit inflorescence with floral parts except calyces omitted. E, F. Pods, showing variation. A, E from *Crisp 5104* (type); B, D from *Crisp 6075*; C, F from *Crisp 6144*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

divergent lower margins, very obtuse, apex rounded, slightly incurved but not enclosing the keel, auriculate, with a small lobe opposite the auricle on the abaxial margin, saccate, 4.5–5 × 2–2.75 mm including the 1.5–1.75 mm claw, red; *keel* half transversely broadly elliptic, constricted to a short beak, incurved, auriculate, saccate, rugose abaxially, 4–5 × 1.5–2 mm including the 1.5–2 mm claw, crimson. *Stamens* strongly dimorphic: inner whorl of 5 with longer filaments and very small, dorsifixed anthers and confluent thecae; outer whorl of 5 with shorter filaments and longish, 2-celled anthers; filaments free, successively broader from keel towards standard, those two

nearest the standard upwardly dilated; vexillary stamen (inner whorl) with filament broad, channelled, clasping the ovary and style, flared into a pedestal at apex. *Pods* obliquely very broadly to shallowly obtriangular, turgid, thick-walled,  $\pm$  obtuse, 11–12  $\times$  8–11 mm; evenly red-brown or purplish; upper suture straight to curving upwards; lower suture acute. *Seed* not seen. (Fig. 100).

**Flowering period:**—June to September. *Fruiting period:* August to November.

**Distribution:**—Western Australia, from Chidlow (east of Perth) south through Narrogin to Cape Riche and Kalgan and east through the Stirling Range to near Ravensthope.

**Habitat:**—Grows in a range of soil types, from sand over granite or laterite to clay (sometimes gravelly) in *Eucalyptus*-dominated woodland or mallee, or kwongan heathland.

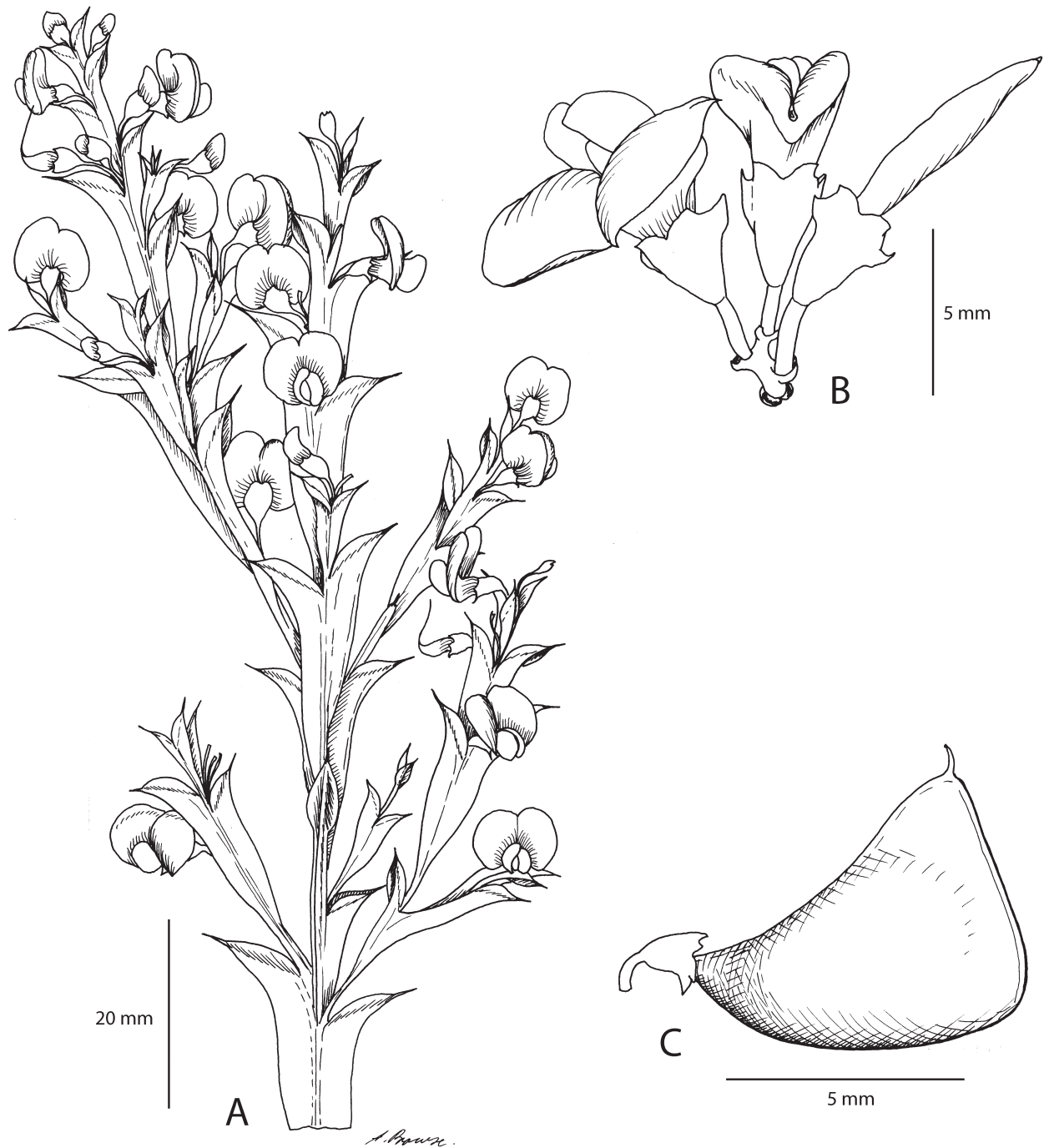
**Selected specimens (35 examined):**—WESTERN AUSTRALIA. **Avon:** Kojonup 6182, Nyabing, *V.F. McDougall* 3, 1 August 1955 (CANB, PERTH); Timber Reserve 20802, near Cuballing, 32°49'S, 117°11'E, *G. Durell s.n.*, 21 September 1988 (CANB 8803137). **Roe:** 5 km N of Nyabing, 33°30'S, 118°09'E, *M.D. Crisp* 6144, *et al.*, 26 September 1979 (CBG, PERTH); Jerramungup, 33°57'S, 118°55'E, *C.E. Woolcock* D63, 31 July 1981 (CBG). **Eyre:** Pallinup River crossing, Mara Bridge, between Albany and Jerramungup, 34°24'S, 118°44'E, *E.M. Canning s.n.*, 9 November 1968 (CBG 36911); Cape Riche, 34°36'S, 118°46'E, *C.A. Gardner* 6532, 12 October 1942 (PERTH); Paper Collar Gully, Chester Pass, Stirling Range, 34°19'S, 118°11'E, *A.S. George* 6370, 9 August 1964 (PERTH); 11 km N of Boxwood Hill along Highway 1 towards Jerramungup, 34°17'S, 118°49'E, *M.D. Crisp* 6075, *et al.*, 22 September 1979 (CBG, MEL, NSW, PERTH); Boxwood Hills–Toompup road, 31 km NW from Chillilup Pool turnoff, 34°07'S, 118°29'E, *M.D. Crisp* 5169, 15 January 1979 (CBG, K).

**Affinity:**—In its typical form, this species differs from *D. trigonophylla* mainly in its phyllodes being strictly vertically flattened, and not dilated horizontally along the upper edge. Additionally, *D. trigonophylla* differs in having a minutely scabrous epidermis. The typical form of *D. decipiens* occurs near the sea; plants from farther inland have more strongly flexuose branchlets and subulate phyllodes reminiscent of *D. flexuosa*. However, *D. decipiens* may be readily distinguished from *D. flexuosa* by the pods, where *D. flexuosa* has flattened, 15–20 mm long, purple-spotted pods. In addition, *D. decipiens* has a truncate receptacle which is greater in diameter than the pedicel and ciliae present only at the tips of the calyx-lobes, whereas in *D. flexuosa* the receptacle is tapered evenly to the pedicel, and the calyx is evenly ciliate around the margins.

Other species with decurrent, vertically flattened phyllodes are *D. decurrens*, *D. dilatata* and *D. pectinata*. *Daviesia decurrens* differs from *D. decipiens* in having striate phyllodes and bracts, *D. dilatata* differs in lacking sharp ridges or wings running down the branchlets and in having multiple flowers per raceme, and *D. pectinata* differs in having 3–10-flowered racemes and compressed pods not more than 10 mm long.

**100. *Daviesia trigonophylla*** Meisner (1848: 213), Bentham (1864: 87), Crisp (1995: 1239). Type: 'Swan River, Drummond coll. III. No. 77.' Holotype: BM; isotypes: G (3 sheets), K (2 sheets), OXF, P, W

Compact to bushy, scabrous *shrubs*, to 1 m tall. *Root anatomy* unknown. *Branchlets* ascending (rarely divaricate), 3–4-winged with the decurrent phyllode bases, becoming angular and ribbed as the wings narrow downwards. *Phyllodes* scattered, curving outward at 60–90°, trigonous in transection with an elliptic or ovate, somewhat folded upwards, adaxial lamina and a vertical abaxial decurrent wing, apically acuminate, pungent, 3–15  $\times$  2–7 mm, mostly hispid all over, occasionally with hairs only on the margins, green. *Unit inflorescences* 1 per axil, racemose, 2(3)-flowered; *peduncle* ca. 0.5 mm long; *rachis* 0.5–2 mm long; *subtending bracts* ascending, oblong, keeled, ca. 0.5 mm long. *Pedicels* 1.5–2.5 mm long. *Calyx* 3–3.5 mm long including the 0.75–1 mm receptacle; lobes 0.5–1 mm long; upper 2 lobes united into a broad, truncate lip; lower 3 lobes triangular, recurved. *Corolla: standard* transversely elliptic to broadly so, emarginate, cordate, 5.5–8  $\times$  6–9.5 mm including the 1.5–2 mm claw, outer two-thirds orange, inner third dark red with 2 pale yellow spots; *wings* very broadly obovate to transversely so with a rounded, incurved apex, slightly overlapping the keel, auriculate, with a small lobe on the abaxial margin, 5–6  $\times$  3.5–4 mm including the 1.5–2 mm claw, maroon; *keel* half transversely elliptic, obtuse, auriculate, saccate, 4–5  $\times$  2 mm including the 1.5–2 mm claw, maroon. *Stamens* moderately dimorphic: inner whorl of 5 with longer, slender, terete filaments and slightly shorter, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader, compressed filaments and slightly longer, 2-celled, basifixed anthers; filaments cohering; vexillary stamen with a channelled filament forming an apical pedestal subtending the anther. *Pod* obliquely shallowly obtriangular, acute to scarcely obtuse, turgid, 11–13  $\times$  8.5–9 mm; upper suture swept upwards; lower suture acute but broadly rounded. *Seed* not seen. (Fig. 101).



**FIGURE 101.** *Daviesia trigonophylla*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6118*; C from *Crisp 5260*. Drawn by A.L. Prowse.

**Flowering period:**—August to October. *Fruiting period:* September and October.

**Distribution:**—Western Australia, Stirling Range to the adjacent coast.

**Habitat:**—Grows on stony, skeletal soil in diverse tall closed-heath, or mallee-heath dominated by *Eucalyptus* spp.

**Selected specimens (13 examined):**—**WESTERN AUSTRALIA.** **Eyre:** Due N of Ellen Peak and due W of Moir Hill, 34°19'S, 118°20'E, *M.D. Crisp 8954* & *W. Keys*, 15 October 1996 (CBG, PERTH); Stirling Range, 24 km W of Chester Pass, on road to Red Gum Pass, 34°26'S, 117°55'E, *T.B. Muir 3904*, 28 September 1966 (MEL); Stirling Range, 10 km along East Pillenorup Track from Chester Pass Road, 34°26'S, 118°10'E, *M.D. Crisp 5260*, 18 January 1979 (CBG, PERTH); Stirling Range, 2 km SE of Wedge Hill, 34°26'S, 118°11'E, *M.D. Crisp 6118*, et

*al.*, 24 September 1979 (CBG, K, MEL); Stirling Range Drive, at base of Mondurup Peak track, 34°24'S, 117°49'E, *M.D. Crisp 8494 & W. Keys*, 25 September 1993 (CBG, GAUBA, PERTH, UWA).

**Affinity:**—*Daviesia trigonophylla* is immediately recognised by its triquetrous, strongly decurrent phyllodes. It is superficially similar to *D. decipiens*, which is easily distinguished by its strictly vertically flattened phyllodes and absence of scabrous indumentum.

**101. *Daviesia dilatata*** Crisp (1995: 1187). Type: Western Australia, Roe, 80 km NE of Ravensthorpe, 33°08'S, 120°41'E, *M.D. Crisp 6037, J. Taylor & R. Jackson*, 21 September 1979. Holotype: CBG; isotype: PERTH

Open *shrubs* to 1 m high, glabrous, grey-green to glaucous. *Root anatomy* unknown. *Branchlets* gently flexuose, terete to bluntly trigonous in cross-section, smooth when fresh, striate when dry. *Phyllodes* scattered, ascending, ± decurved, vertically dilated, often strongly sickle-shaped, sometimes subulate and divaricate or gently recurved, very rigid, tapered to a conspicuously black pungent apex, shortly decurrent at the broad base, 7–50 mm long, 2–8 mm broad, smooth when fresh, striate when dry. *Unit inflorescences* condensed, cluster-like racemes, 3–8-flowered; *peduncle* up to 0.5 mm long; *rachis* 1–2 mm long; *subtending bracts* spreading, spatulate, apex fimbriate, ca. 1 mm long. *Pedicels* 1–3.5 mm long. *Calyx* rather narrow, 4–5 mm long including the ca. 1.5 mm attenuate receptacle; lobes recurved; upper 2 lobes united into a truncate, emarginate lip, ca. 1 mm long; lower 3 lobes triangular, acuminate, ca. 0.75 mm long. *Corolla: standard* transversely elliptic, emarginate, strongly recurved, 6–6.5 × 6–7.5 mm including the 1.5–2 mm claw, mostly orange with a red central ring around a yellow centre; *wings* obovate with a rounded, incurved apex enclosing the keel, auriculate, 6–6.5 × 2.25–3 mm including the 2–2.5 mm claw, dark crimson; *keel* half transversely broadly elliptic, incurved with an acute apex, auriculate, saccate, 5–6 × 2 mm including the 2–2.5 mm claw, dark crimson. *Stamens* strongly dimorphic: inner whorl of 5 with longer filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with shorter filaments and oblong, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly obtriangular, acute, compressed, 7–8 × ca. 5 mm, red-brown; upper suture sigmoid; lower suture obtuse. *Seed* not seen. (Fig. 102).

**Flowering period:**—August and September. *Fruiting period:* September and October.

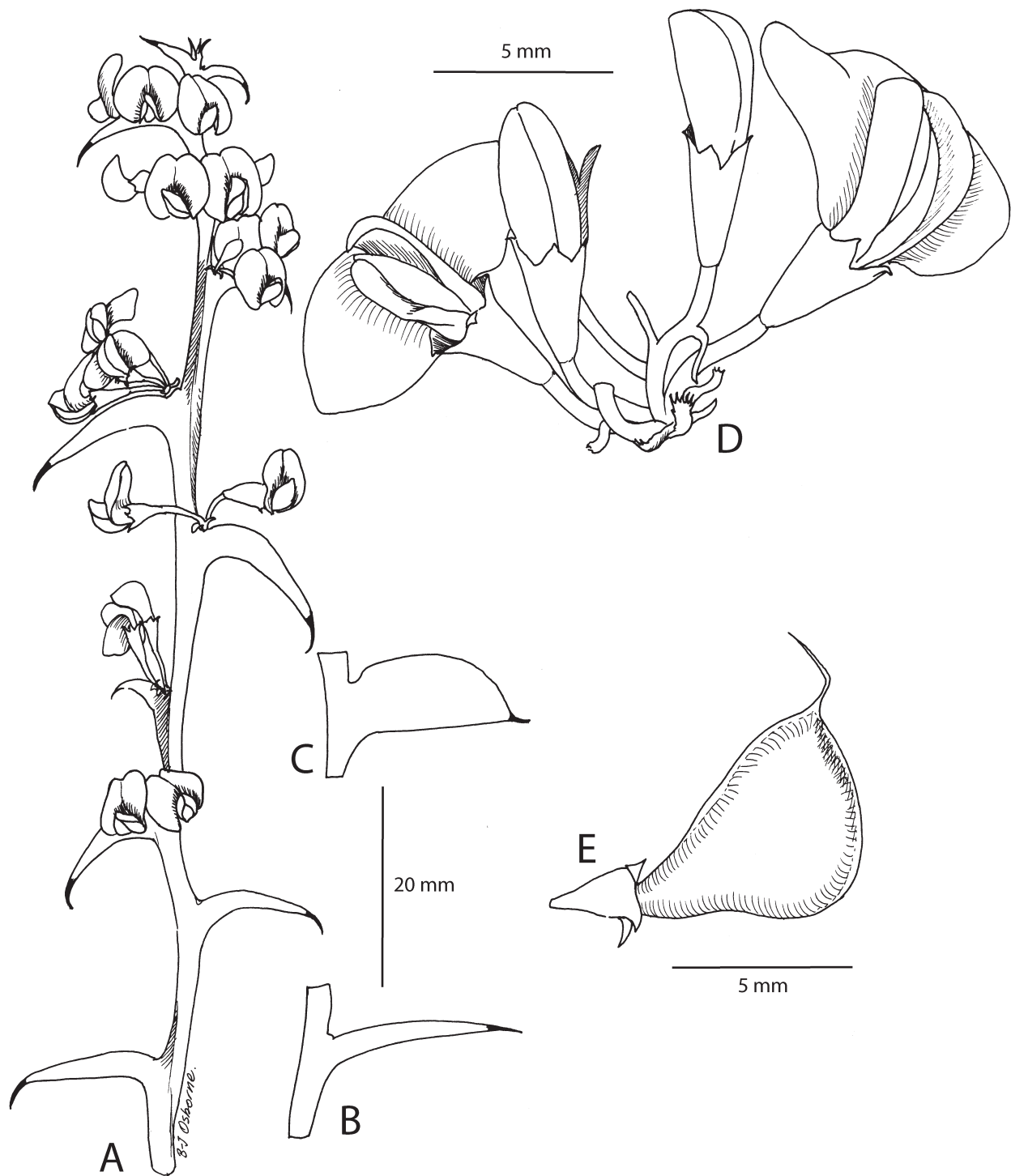
**Distribution:**—Western Australia, southern-most Avon, Eyre and Roe Districts, from Nyabing south to near Bremer Bay and east to Mt Ragged.

**Habitat:**—Occurs in sandy, and occasionally gravelly soil on flat terrain, in low heath to tall shrubland with mallee *Eucalyptus* spp. dominating the overstorey.

**Selected specimens (23 examined):**—WESTERN AUSTRALIA. **Avon:** Nyabing, eastern edge, 33°33'S, 118°09'E, *M.D. Crisp 5204*, 16 January 1979 (CBG, PERTH); 10 km from Nyabing along road to Katanning, 33°35'S, 118°03'E, *M.D. Crisp 5198*, 16 January 1979 (AD, CBG, MEL). **Roe:** 11 km E of Gnowangerup, 33°57'S, 118°06'E, *K. Newbey 442*, 9 September 1962 (PERTH); 32 km SW of Newdegate, E boundary of Reserve no. 29023, 33°19'S, 118°47'E, *J.M. Koch N130*, 16 January 1979 (PERTH); ca. 90 km NE of Ravensthorpe, 9 km SW of Welcome Soak, 33°05'S, 120°46'E, *M.D. Crisp 6035, et al.*, 21 September 1979 (CBG, PERTH). **Eyre:** 1.56 km SW of Mt Desmond, 33°37'S, 120°09'E, *M.D. Crisp 8989 & W. Keys*, 20 October 1996 (CBG, PERTH); 34 km W of Bremer Bay, ca. 34°24'S, 119°03'E, *J.W. Green 4839*, 23 August 1978 (PERTH); Fitzgerald River National Park, 31 km S of Ravensthorpe along road to Hamersley River estuary, 33°49'S, 119°55'E, *M.D. Crisp 5008*, 10 January 1979 (CBG); 33.5 km N of Hopetoun along road to Ravensthorpe, 33°40'S, 120°06'E, *P.S. Short 2685, et al.*, 4 September 1986 (CBG, MEL, PERTH); 3 km WNW of Cape Riche, near Cheyne Inlet, 34°36'S, 118°45'E, *M.D. Crisp 5105*, 14 January 1979 (CBG, PERTH).

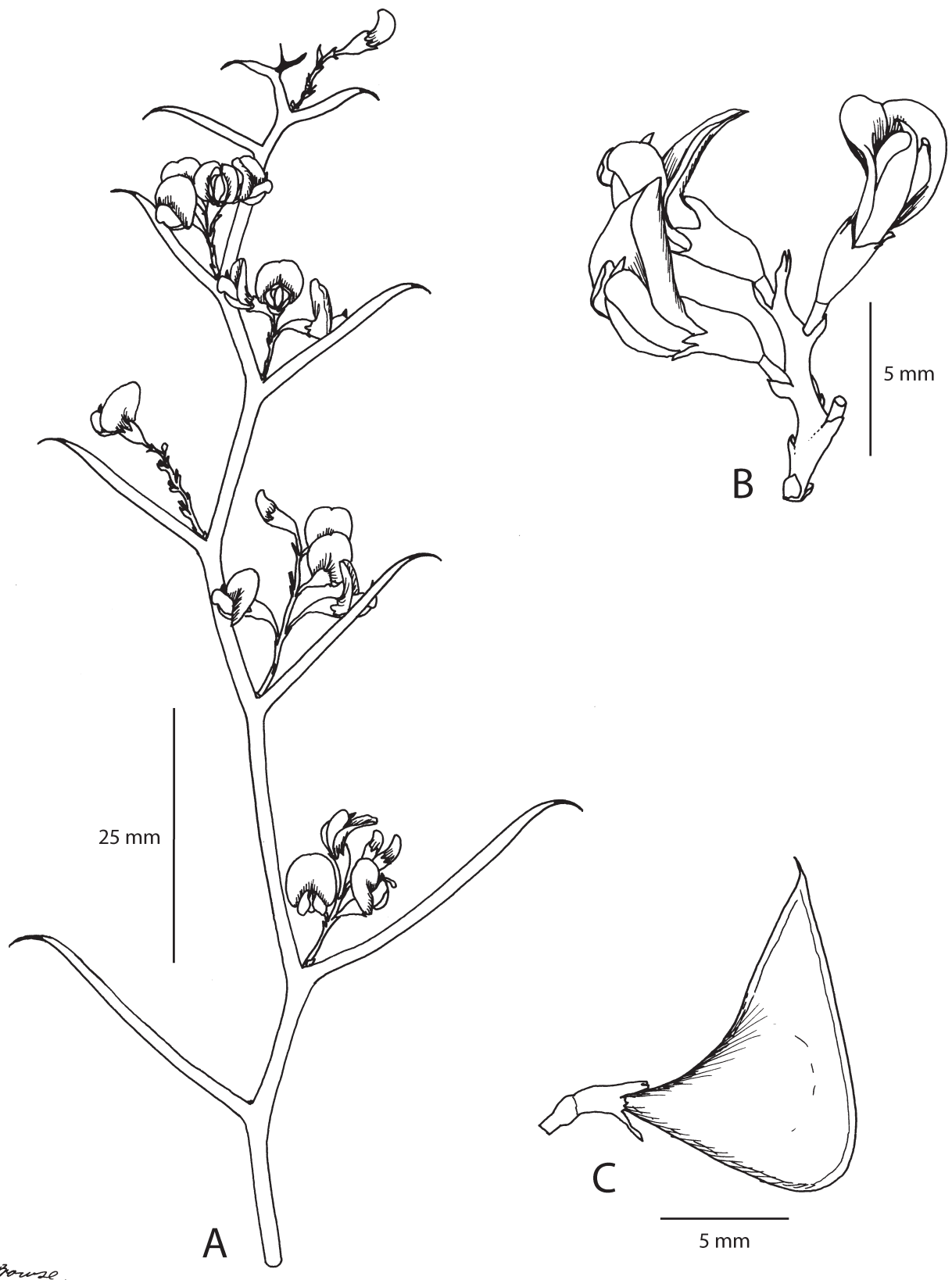
**Affinity:**—This species presents an obvious similarity to both *D. decurrens* and *D. pectinata*, and has been confused with them. In the fresh state, both may be distinguished from *D. dilatata* by the striations and ridges along their phyllodes and branchlets. In particular, the decurrent phyllode-bases make the cross-section of the branchlets sharply triquetrous. When dry, *D. dilatata* is lightly striate, but neither ridged or ribbed, and the cross-section of the branchlets is bluntly trigonous (immediately below the phyllodes) or terete (lower down). The phyllodes of *D. decurrens* and *D. pectinata* are not as frequently or strongly decurved as in *D. dilatata*. A well-developed raceme-rachis further distinguishes *D. pectinata*, and striate bracts further distinguish *D. decurrens*.

This species is also similar to *D. subulata*, which differs in having exclusively subulate phyllodes, whilst the upper two calyx lobes are not united in a truncate lip and the lower three lobes flare outwards.



**FIGURE 102.** *Daviesia dilatata*. A. Flowering branchlet. B, C. Phyllode variation. D. Inflorescence. E. Pod. A, D from *Crisp 6037* (type); B from *Crisp 5204*; C from *Green 4839*; E from *Crisp 5105*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**102. *Daviesia uncinata*** Crisp (1995: 1243). Type: Western Australia, Avon [approximate locality data given because the species is rare]: E of Quairading, 32°S, 117°40'E, *M.D. Crisp 5511*, 27 January 1979. Holotype: CBG; isotypes: AD, G, K, NSW, PERTH



**FIGURE 103.** *Daviesia uncinata*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 5511* (type); C from *Crisp 6184*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Intricate, multi-stemmed *shrubs*, to 0.7 m high and 1 m broad, glabrous, glaucescent. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete, flexuose, smooth when fresh, striate

when dry. *Phyllodes* scattered, ascending at 30–60°, terete or vertically compressed, apex uncinata, acuminate or acicular, pungent, base inarticulate and continuous with the branchlet, 5–70 × 1–2 mm, smooth when fresh, striate when dry. *Unit inflorescences* 1 per axil, racemose or slightly paniculate, 2–several-flowered; *peduncle* 1–4 mm long; *rachis* flexuose, 0.5–8.5 mm long; *subtending bracts* appressed, oblong, up to 1 mm long. *Pedicels* 1–1.5 mm long. *Calyx* narrowly campanulate, 2.5–3.5 mm long including the ca. 1 mm receptacle; upper 2 lobes united in a truncate lip, ca. 1 mm long; lower 3 lobes triangular, ca. 0.5–0.75 mm long. *Corolla: standard* very broadly obovate, emarginate, 6–7 × 4–5 mm including the ca. 1.5 mm claw, callose, rich yellow with dark pinkish red markings; *wings* narrowly obovate, apex rounded and incurved to partially enclose the keel, auriculate, 5.5–6 × 1.5–1.75 mm including the 1–1.5 mm claw, pinkish red; *keel* half narrowly elliptic, uncinata, supervolute and acicular at the tip, auriculate, saccate, 5.5–6.5 × 1.5 mm including the 1–1.5 mm claw, enclosing stamens even after anthesis, pinkish red with a blackish tip. *Stamens* weakly dimorphic: inner whorl of 5 with longer filaments and shorter, subversatile anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; anthers all 2-celled; filaments all compressed and lightly cohering. *Style* uncinata. *Pod* obliquely shallowly obtriangular, tapered to the long acute apex, compressed, 11–15 × 6.5–8 mm; upper suture slightly sigmoid; lower suture acute. *Seed* very broadly obovoid, ca. 4 mm long, 3 mm broad, 2.5 mm thick; *aril* ca. 3 mm long. (Fig. 103).

**Flowering period:**—October to January. *Fruiting period:* July to February.

**Distribution:**—Western Australia, south-central wheatbelt, within the area delimited by Kellerberrin, Piesseville and Lake Magenta.

**Habitat:**—Grows in sandy soil, sometimes loamy or gravelly, often on sandplains or claypans, in mixed kwongan heathland with *Allocasuarina*, *Banksia* and *Verticordia* among the more dominant genera.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed.

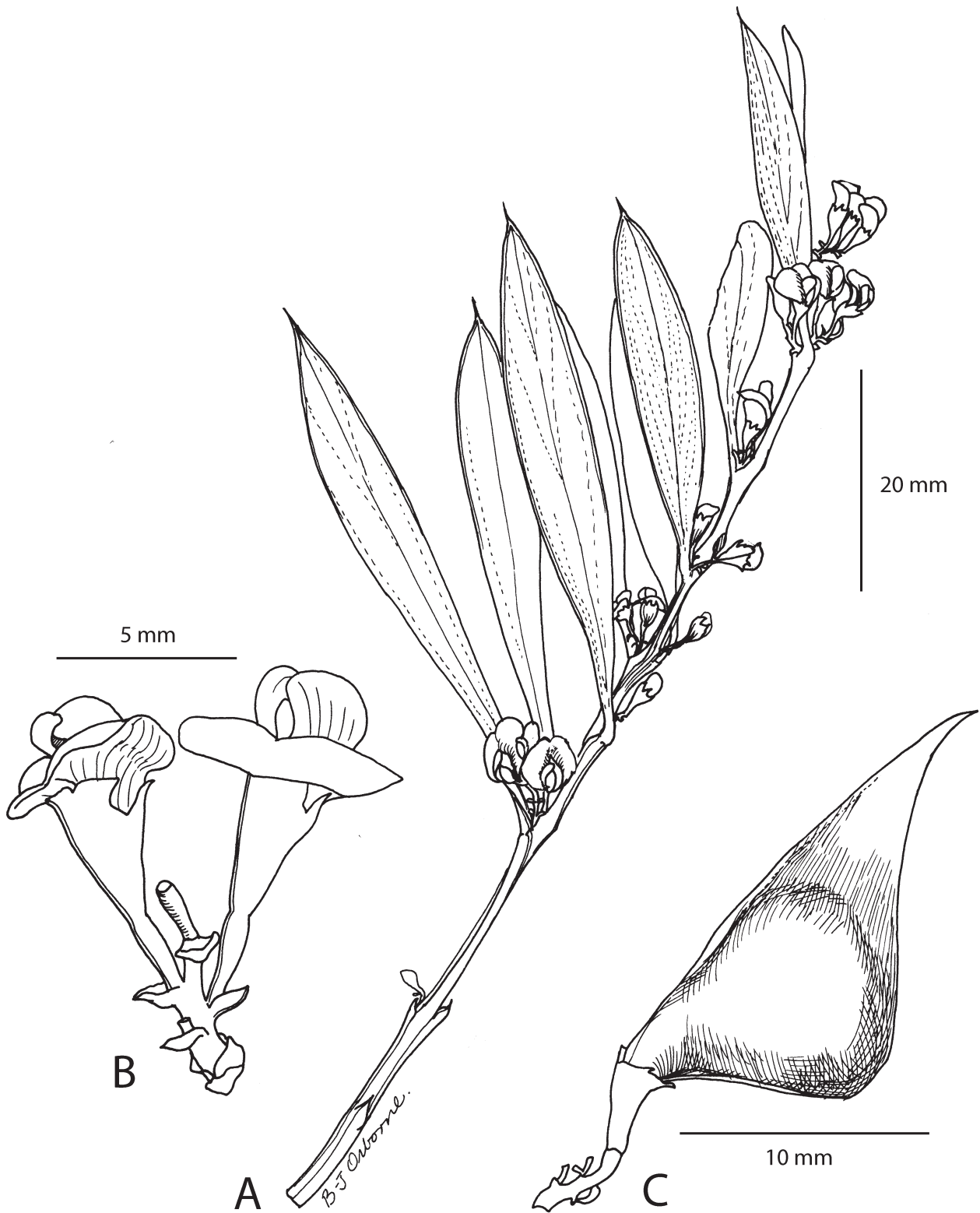
**Selected specimens (16 examined):**—Approximate locality data are given because the species is rare.

**WESTERN AUSTRALIA. Avon:** S of Tammin, 31°50'S, 117°30'E, *M.D. Crisp 5504*, 27 January 1979 (CBG, L, MEL, PERTH, US); *ibid.*, *R.D. Royce 9418*, 13 November 1970 (CBG, PERTH); S of Quairading, 32°20'S, 117°20'E, *M.D. Crisp 6184, et al.*, 27 September 1979 (CBG, PERTH). **Roe:** E of Pingaring, 32°50'S, 119°107'E, *M.D. Crisp 5548*, 29 January 1979 (AD, CBG, K, MO, PERTH); E of Newdegate, 33°10'S, 118°50'E, *A.S. George 2269*, 14 December 1960 (PERTH); between Lake Grace and Newdegate, 32°40'S, 119°E, *C.A. Gardner 1371 & W.E. Blackall*, 19 November 1931 (PERTH).

**Affinity:**—*Daviesia uncinata* is characterised above all by its uncinata phyllodes, for which it is named. The stamens of *D. uncinata* are all 2-celled, a widespread character in the genus (Pate *et al.* 1989); however, the loculi are opposed (back to back) on either side of the connective, which appears to be a distinctive feature of this species. *Daviesia rhizomata* is superficially similar but differs in its extensively rhizomatous growth habit, patent to retrorse phyllodes with a straight to gently recurved apex, 1-flowered unit inflorescences, larger flowers (e.g. calyx 4–5 mm long, standard 7–9 mm broad) and a keel with a straight, non-acicular tip that drops away to expose the stamens. Another species with a recurved phyllode apex is *D. hamata*, but it differs in having shorter phyllodes (mostly 2–10 mm long), and in being winter-flowering (*D. uncinata* flowers in summer).

**103. *Daviesia daphnoides*** Meisner (1844: 54), Bentham (1864: 79), Crisp (1995: 1185). Type: 'In planitie arenosa Quangen (Victoria) d. 20. Mart. 1840. Herb. Preiss. No. 1144. (Drummond n. 225.)' Lectotype (Crisp 1995: 1185): *Preiss 1144* (LD); isoelectotypes: G (2 sheets), MEL (2 sheets), MO, NY (ex Herb. Meisn.), P, W. Syntype: *Drummond 225* (BM, ex Herb. Shuttleworth); isosyntypes: G (2 sheets), K (2 sheets), OXF, MEL, P (2 sheets), PERTH, W (2 sheets)

Bushy to spreading *shrubs*, to 1.5 m high and broad, glabrous, glaucous. *Root anatomy* unknown. *Branchlets* ascending, terete to tetragonal or triquetrous, ribbed. *Phyllodes* moderately crowded, ± erect, narrow-elliptic to -obovate, acute or acuminate, ± pungent, lamina sometimes oblique, tapered to the often petiole-like base, articulate, 25–68 × 4.5–9 mm, thickish when fresh, wrinkled with visible venation when dry. *Unit inflorescences* 1 or 2 per axil, racemose, 2–6-flowered; *peduncle* 0.5–4.5 mm long; *rachis* 0.25–11 mm long; *barren basal bracts* oblong to triangular, up to 0.5 mm long. *Pedicel* thickening towards the apex, 0.75–3 mm long; *subtending bracts* rhombic to approaching oblong, keeled, hooded, ca. 0.75 mm long. *Calyx* ca. 4–4.25 mm long including the 1.5–2 mm stipe-like receptacle; upper 2 lobes united into a truncate lip, ca. 0.5–1 mm long; lower 3 lobes triangular, ca.



**FIGURE 104.** *Daviesia daphnoides*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6524*; C from *Crisp 5408*. Drawn by B-J. Osborne.

0.25–0.75 mm long. *Corolla*: *standard* transversely ovate, emarginate, 5–5.75 × 5–6 mm including the 1.25–1.5 mm claw, with a prominent central channel, yellow surrounding a large dark red emarginate blotch with an inconspicuous greenish linear central mark, fading to paler yellow and grey; *wings* obovate with a rounded apex, uncinuate auricles, saccate, 5.5–6 × 2.5–3 mm including the 1.25–1.5 mm claw, dull red grading to orange or yellow



at the tip and margins; *keel* half broadly elliptic, acute, auriculate, saccate, ca.  $4 \times 1.75$  mm including the 1 mm claw, dark red. *Stamens* slightly dimorphic: inner whorl of 5 with longer, slender filaments and subversatile anthers; outer whorl of 5 shorter with broader filaments and basifixed anthers; filaments all compressed and lightly cohering; anthers all 2-celled. *Pod* obliquely shallowly (rarely very shallowly) obtriangular with a long, tapering, acuminate apex, turgid, thick-walled  $15\text{--}21 \times 6\text{--}11$  mm; upper suture sigmoid to almost straight; lower suture acute. *Seed* globose (plump), red-brown with a white, continuous aril. (Fig. 104).

**Flowering period:**—April to July. *Fruiting period:* August to October.

**Distribution:**—Western Australia from Walkaway (south of Geraldton) south to the eastern wheatbelt, east of Perth.

**Habitat:**—Gravelly sand in undulating terrain in kwongan heathland.

**Selected specimens (32 examined):**—**WESTERN AUSTRALIA.** **Irwin:** 42 km W of Winchester,  $29^{\circ}49'S$ ,  $115^{\circ}34'E$ , *C. Chapman* (1)76, 7 May 1976 (AD, CBG, MEL, PERTH); 37 km W of Yandanooka,  $29^{\circ}19'S$ ,  $115^{\circ}34'E$ , *J.S. Beard* 7235, 31 October 1974 (PERTH); intersection of Green Head Road and Brand Highway,  $30^{\circ}04'S$ ,  $115^{\circ}20'E$ , *M.D. Crisp* 5408, 24 January 1979 (CBG). **Avon:** 4 km N of Wongan Hills town,  $30^{\circ}51'S$ ,  $116^{\circ}43'E$ , *M.D. Crisp* 6524, 17 July 1980 (CBG, MEL, PERTH, US); NW outskirts of Wongan Hills township between Piawaning Road and railway line,  $30^{\circ}49'S$ ,  $116^{\circ}37'E$ , *M.G. Corrick* 9281, 14 October 1984 (CANB, MEL). **Darling:** Mogumber Mission,  $31^{\circ}02'S$ ,  $116^{\circ}02'E$ , *A.S. George* 6202, 12 April 1964 (PERTH).

**Affinity:**—This species is closely related to *D. emarginata* (Fig. 1B), with which it shares a similarity in general aspect, as well as details of the reproductive structures. The most obvious difference is seen in the phyllode apex, which is obtuse and emarginate in *D. emarginata*, but acuminate and pungent in *D. daphnoides*.

**104. *Daviesia emarginata*** (Miq.) Crisp (1995: 1191). *Fusanus emarginatus* Miquel (1845: 617). Type: 'In asperis haud longe a monte Wuljenup distr. Plantagenet, October 1840. Herb. Preiss. no. 2112.' Lectotype (Crisp 1995: 1191): LD (sheet stamped 82/73–2132); isoelectotype: G, K, MEL, U

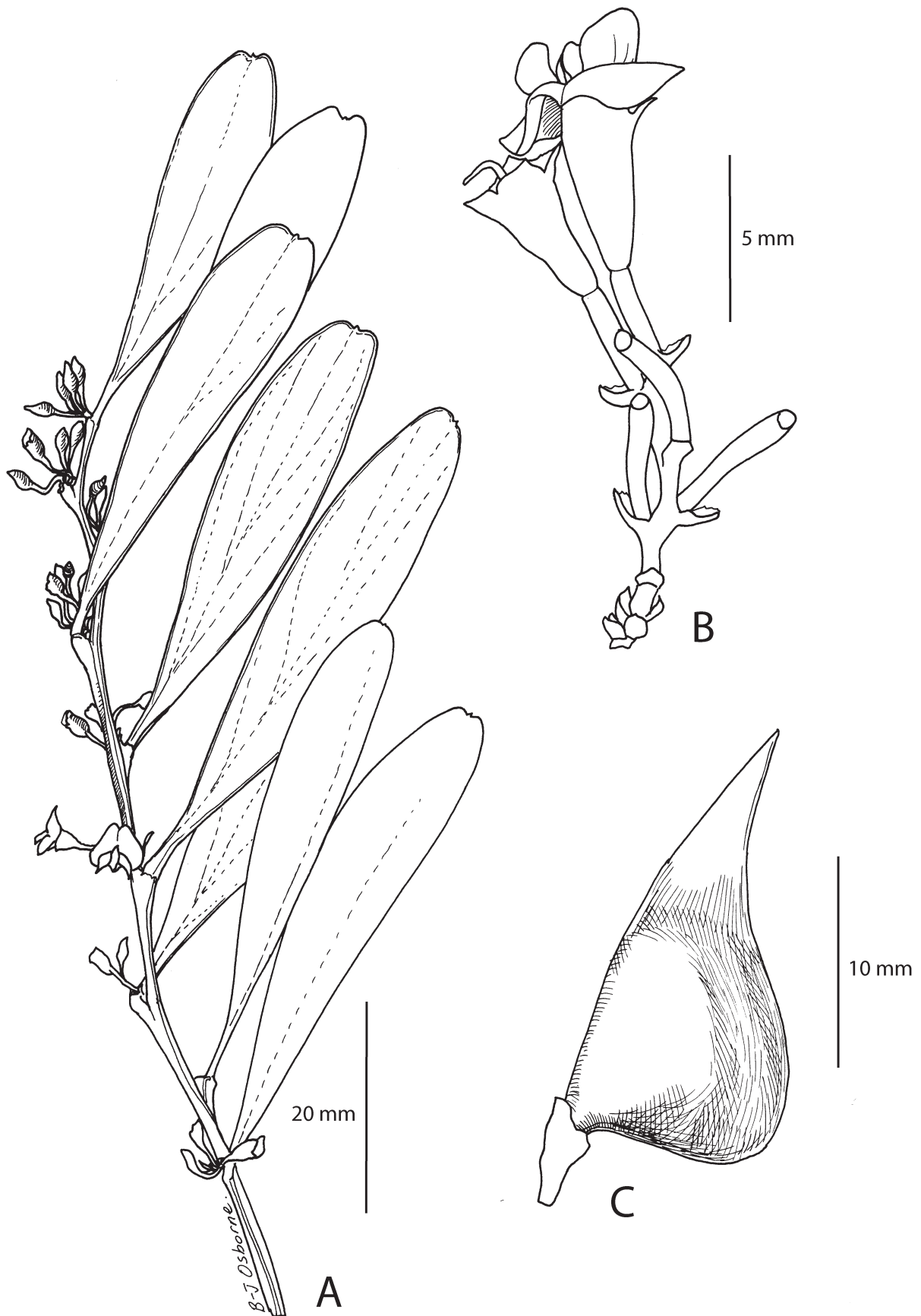
*Daviesia obtusifolia* Mueller (1860: 104), Bentham (1864: 77). Type: 'In planitiebus prope Willonjup Novae Hollandiae austro-occidentalis. Mxw.' Holotype: MEL.

[*Fusanus spicatus* auct. non Brown (1810: 255): Miquel (1845: 617). Specimen cited: 'Ad prom. Cape-Riche, 21 Nov. 1840 lect. Herb. Preiss. No. 2119.' Specimens seen: LD.]

*Shrubs*, 0.3–1.7 m high, mostly glabrous though occasionally with sparse hairs on branchlets and phyllodes. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete to triquetrous, ribbed. *Phyllodes* scattered, ascending to erect, narrowly obovate to obovate, apex rounded to emarginate, mucronate, base constricted to a pseudo-pedicel, articulate,  $24\text{--}50 \times 3.5\text{--}9.5$  mm, thickish when fresh, wrinkled with visible venation when dry, pale green with yellow margins, glaucescent. *Unit inflorescences* 1 per axil, racemose, 3–8-flowered; *peduncle* 1.5–6 mm long; *rachis* 3–12 mm long; *barren basal bracts* oblong, ca. 0.5 mm long; *subtending bracts* oblong, ca. 1 mm long. *Pedicel* 2.5–4 mm long, thickened towards the apex. *Calyx* with minute white dots, 4.5–5 mm long including the ca. 2 mm, stipe-like receptacle; upper 2 lobes united into a broad, truncate lip, ca. 1.25 mm long; lower 3 lobes triangular, ca. 0.5 mm long. *Corolla: standard* transversely ovate, emarginate, with a prominent central channel, ca.  $4.5 \times 5\text{--}5.5$  mm including the 1.25 mm claw, yellow; *wings* obovate with a rounded, incurved apex, auriculate, slightly saccate, sometimes unequal in size, ca.  $4.5 \times 2.5$  mm including the 1.25 mm claw, yellow with a pink base; *keel* half very broadly elliptic with an obtuse apex (spout-like), auriculate, saccate, ca.  $4.25 \times 1.75$  mm including the 1.25 mm claw, yellow with a pink base. *Stamens* slightly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, slightly rounder, subversatile, 2-celled anthers; outer whorl of 5 with shorter, broader, flattened filaments and longer, narrower, basifixed, 2-celled anthers; filaments cohering. *Pod* obliquely shallowly obtriangular with an acuminate apex, robust,  $18\text{--}21 \times 9\text{--}9.5$  mm, leathery; upper suture almost straight; lower suture acute. *Seed* with a continuous aril. (Fig. 105).

**Flowering period:**—January to May. *Fruiting period:* The only two specimens seen fruiting were both collected in October.

**Distribution:**—Western Australia, south coast and hinterland from Albany and the Stirling Range east to Ravensthorpe.



**FIGURE 105.** *Daviesia emarginata*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *Green 393*; B from *Crisp 4982*; C from *Crisp 5019*. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Habitat:**—Grows in sand and lateritic soil, on undulating sandplains in mallee-heathland, including eucalypts such as *E. goniantha* Turczaninow (1847: 163), *E. incrassata* Labillardière (1806: t. 150), *E. pleurocarpa* and *E. uncinata* Turczaninow (1849: 23).

**Selected specimens (25 examined):**—**WESTERN AUSTRALIA. Roe:** Dunn Rock Nature Reserve, NW end of Internal Firebreak no. 1, 33°17'S, 119°30'E, *K.J. Atkins 1750*, 7 October 1984. **Eyre:** 37 km S of Borden, ca. 34°21'S, 118°08'E, *J.W. Green 393*, 31 March 1956 (PERTH); near Red Gum Pass, Stirling Range, 34°22'S, 117°48'E, *A.S. George 6109*, 27 March 1964 (PERTH); 7 km NW of Chillinup Pool on Pallinup River, 34°18'S, 118°34'E, *M.D. Crisp 5149*, 15 January 1979 (CBG, MEL, PERTH); SW foot of East Mt Barren, 33°56'S, 120°01'E, *A. Strid 22459*, 16 March 1983 (C, CANB, K, PERTH); Ravensthorpe Range, 9 km SSE of Mt Desmond, 33°41'S, 120°12'E, *M.D. Crisp 4982*, 9 January 1979 (CBG, L); Fitzgerald River National Park, 7 km SW of Annie Peak, 33°53'S, 119°55'E, *M.D. Crisp 5019*, 11 January 1979 (CBG).

**Affinity:**—This species is closely related to *D. daphnoides* (Fig. 1B), which shares a similarity in general aspect, as well as details of the reproductive structures. The most obvious difference is in the phyllode apex, which is acuminate and pungent in *D. daphnoides*, but obtuse and emarginate in *D. emarginata*.

*Daviesia argillacea* was once included under *D. emarginata* as a variety (as *D. obtusiflora* var. *parvifolia*, q.v.) but differs in having smaller (mostly 7–25 mm long), glaucous phyllodes. The molecular phylogeny shows that these species are not closely related and, in morphology, the flowers of *D. argillacea* are quite different; in particular, the calyx is smaller (ca. 3 mm), lacking a long receptacle and white dots.

**105. *Daviesia tortuosa*** Crisp (1995: 1239). Type: Western Australia, Roe [approximate locality data given because the species is rare]: near Lake Grace, 33°10'S, 118°20'E, *M.D. Crisp 5539*, 28 January 1979. Holotype: CBG; isotypes: K, L, MEL, MO, NSW, PERTH

Spreading, divaricate, intricate, wiry *shrubs*, to 1 m high and 2 m broad, glabrous, glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* numerous, strongly zigzag and bending at the regularly spaced nodes, angular with prominent ridges. *Phyllodes* scattered, divaricate but curving inward so that the apex is antrorse, narrowly elliptic or narrowly obovate, margins longitudinally recurved to partly conceal the abaxial surface, apex acuminate, pungent, contracted to a petiole-like articulate base, 10–35 mm long, 4–12 mm broad (when flattened), with midrib obscure or absent, coriaceous, smooth when fresh, wrinkled when dry. *Unit inflorescences* often > 1 per axil, racemose, 2–5-flowered; *peduncle* 3–4 mm long; *rachis* flexuose, 2.5–9 mm long. *Pedicels* 1–2.5 mm long. Floral parts thick, fleshy. *Calyx* 4.5–5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united in a truncate emarginate lip, ca. 1.5 mm long; lower 3 lobes triangular, ca. 0.75 mm long. *Corolla: standard* transversely broadly elliptic, 6.5–7 × 6.5–7 mm including the ca. 1.5 mm claw, with 2 calli at the base of the lamina, rich yellow with faint orange markings; *wings* spatulate, rounded and incurved and overlapping at apex to enclose the keel, auriculate, saccate, 6–7 × 3–3.5 mm including the ca. 2 mm claw, rich yellow; *keel* half transversely elliptic, acute, abaxially rugose, auriculate, saccate, ca. 5 × 2 mm including the 1.5 mm claw, rich yellow. *Stamens* weakly dimorphic: inner whorl of 5 with longer filaments and shorter, versatile anthers; outer whorl of 5 with shorter filaments and slightly longer, basifixed anthers; filaments compressed, free; anthers 2-celled. *Pod* obliquely shallowly obtriangular, tapered to a long, acute, pungent apex, turgid towards base, thick-walled, 18–20 × 8.5–9 mm; upper suture almost straight; lower suture scarcely acute. *Seed* globose, very plump, ca. 4 mm long, 3 mm broad, 2.5 mm thick, orange-brown; *aril* discontinuous at hilum, ca. 2.2 mm long. (Fig. 106).

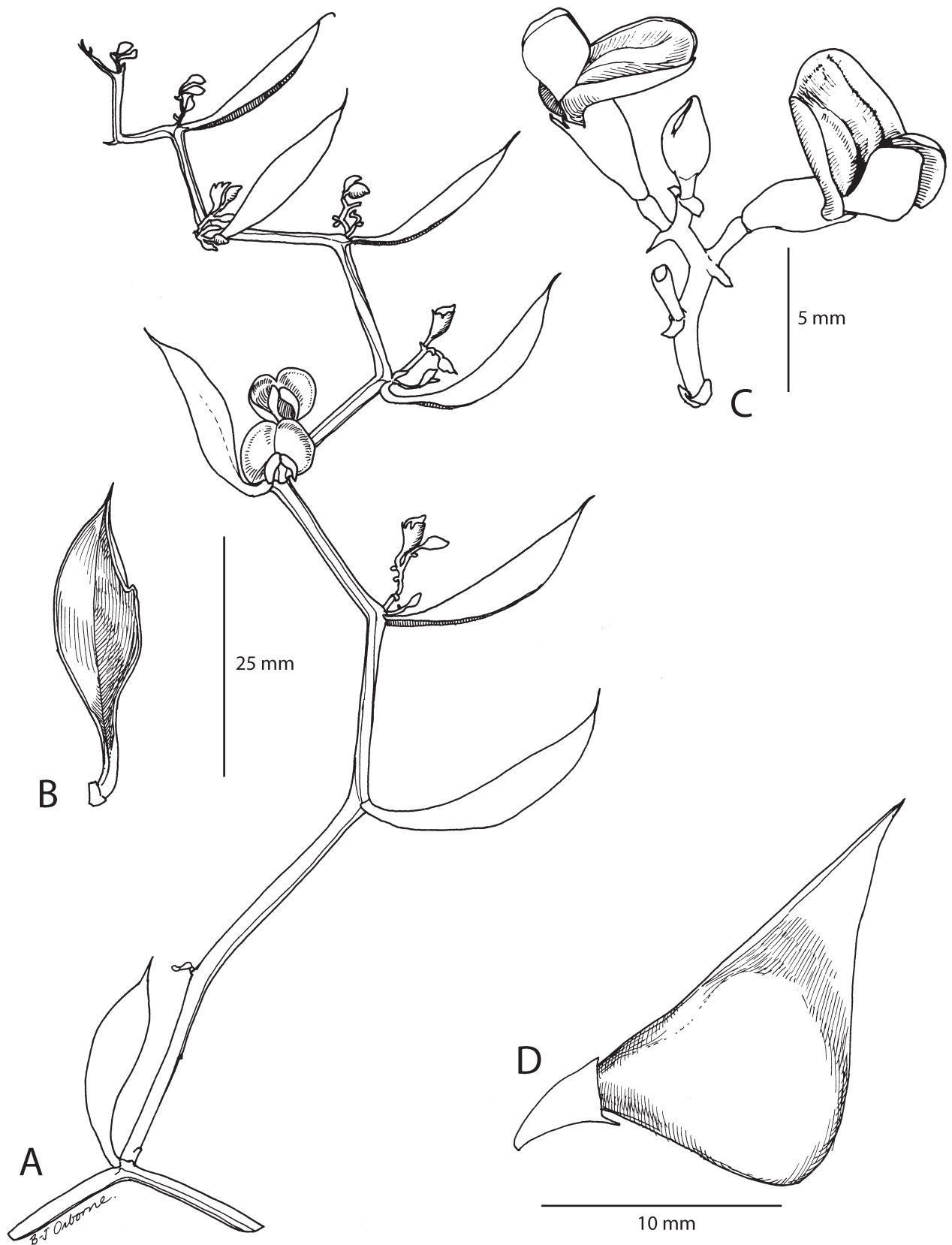
**Flowering period:**—January to April. *Fruiting period:* September.

**Distribution:**—Western Australia, central-eastern wheatbelt, approximately bounded by Kulin, Dumbleyung and Lake Grace.

**Habitat:**—Grows in kwongan heathland on gravelly lateritic or sandy soils.

**Conservation status:**—National: Not listed. WA: Priority 3, possibly threatened or near-threatened but not yet adequately surveyed rated.

**Additional specimens examined:**—Approximate locality data are given because the species is rare. **WESTERN AUSTRALIA. Roe:** Near Dudinin, 32°50'S, 117°50'E, *R.D. Royce 5836*, 7 April 1959 (CANB, PERTH); W of Lake Grace, 33°10'S, 118°10'E, *K. Ward 6711/68*, April 1968 (MEL, NSW, PERTH); *ibid.*, *K. Newbey 1499*, 27 September 1964 (PERTH); NE of Nyabing, 33°20'S, 118°20'E, *J.M. Koch N36*, 19 January 1978 (PERTH); near Lake Grace, Department of Agriculture, 33°10'S, 118°30'E, *J. Nelson s.n.*, March 1968 (PERTH 5201500); near Kukerin, 33°10'S, 118°10'E, *A. Dunham s.n.*, 1 October 1962 (PERTH 5147611).



**FIGURE 106.** *Daviesia tortuosa*. A. Flowering branchlet. B. Phyllode, abaxial view. C. Inflorescence. D. Pod. A–D from *Crisp 5539* (type). Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Affinity:**—In a genus of odd plants, this species stands out as bizarre. The combination of zigzag branchlets with thick, oddly shaped phyllodes can be confused with no other species. However, molecular data indicate that it is close to *D. daphnoides* and *D. emarginata* (Fig. 1B). In the flowers and pods, there is similarity to *D. daphnoides*, but the latter species is easily distinguished by its non-fleshy floral parts, scarcely flexuose branchlets and flat, erect phyllodes.

**106. *Daviesia brevifolia*** Lindl. in Mitchell (1838: 200), Bentham (1864: 84), Crisp (1995: 1177), Jeanes (1996: 760), Craigie (2015: 30). Type: No explicit citation, but date (1 August 1836), and locality can be determined from the journal: Victoria, by the banks of the Glenelg River, just E of present day town Harrow, 37°09'S, 141°38'E. Holotype: *Major Mitchell's Expedition 268*, 1 August 1836 (CGE); isotypes: K (3 sheets), MEL, W

Erect, rigid *shrubs*, to 1.8 m tall, glabrous, glaucescent or glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete, longitudinally wrinkled when dry. *Phyllodes* scattered, divaricate to ascending and gently recurved, inconspicuous and often reduced to scales, terete, apex acuminate or acicular, pungent, especially towards the base of the branchlets, ± constricted at the base (on the adaxial side) when dry but not articulate, 2–8 mm long, 1–1.5 mm broad at the base, smooth when fresh, longitudinally wrinkled when dry. *Juvenile phyllodes* ascending, vertically compressed, dilated upwards, obliquely obovate to linearly elliptic, mucronate, midvein apparent, 15–30 × 2.5–10 mm, becoming adult after only 3 or 4 nodes. *Unit inflorescences* racemose, 1 per axil, 3 or 4-flowered; *peduncle* 1.5–2 mm long; *rachis* 1.5–2.5 mm long; *barren basal bracts* numerous, clustered at base of peduncle, ca. 0.5 mm long; *subtending bracts* oblong, spreading at tips, ca. 1 mm long. *Pedicels* 2–3.5 mm long, gently thickening towards the apex. *Calyx* prominently ribbed, 3–4 mm long including the ca. 0.75–1 mm receptacle; upper 2 lobes united into a broad, truncate lip, ca. 0.5 mm long; lower 3 lobes triangular, ca. 0.5–0.75 mm long. *Corolla: standard* transversely elliptic, emarginate, 6.5–8 × 6–8 mm including the 1.5–2 mm claw, with a very small central groove towards the base, orange with apricot to pink infusion towards the margin and deep red-brown to maroon centre and radiating veins, fading to yellow and grey; *wings* obovate with a rounded, incurved apex that encloses the keel, auriculate, 7–7.5 × 2.25–2.75 mm including the 2–2.5 mm claw, deep pink-red; *keel* half very broadly ovate, with an acicular beak, saccate, 7.5–8 × 2 mm including the 3.5–4 mm claw, red with a dark tip. *Stamens* slightly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, round, versatile anthers; outer whorl of 5 with shorter, broader, compressed filaments and much longer, oblong, basifixed anthers; anthers all 2-celled; filaments free. *Pod* obliquely shallowly to very broadly obtriangular with an acute apex, turgid, 9–15 × 8–12 mm; upper suture undulate; lower suture acute to ca. 90°. *Seed* obloid, with a slightly raised radicular lobe, 2.9–4.2 mm long, 1.7–3 mm broad, 1.5–2.5 mm thick, black to brown; *aril* 1.5–2 mm long. (Fig. 107).

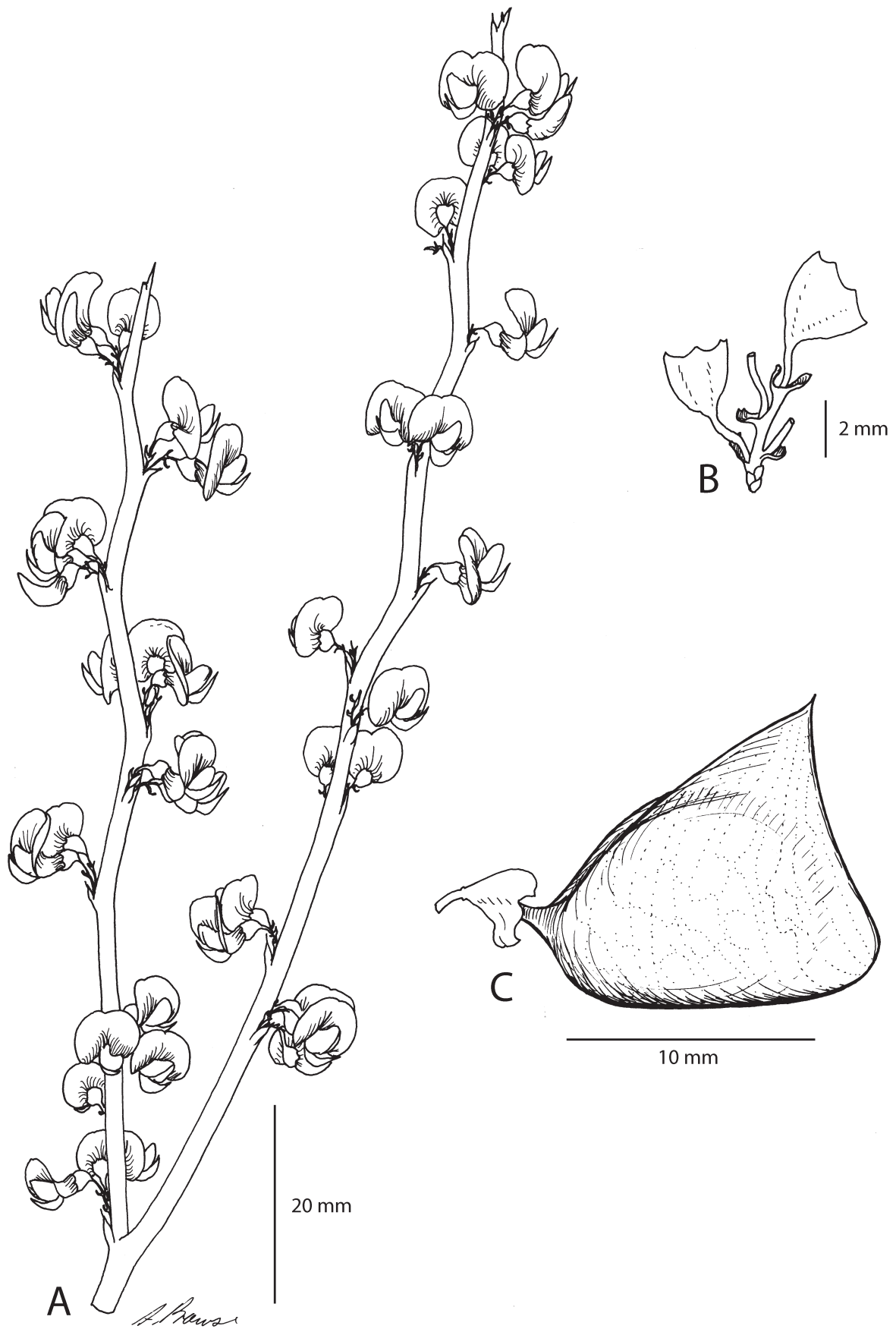
**Common name:**—Leafless Bitter-pea.

**Flowering period:**—August to October. *Fruiting period:* October to December.

**Distribution:**—South Australia and Victoria: from southern Eyre Peninsula (around Mt Hope and Port Lincoln) to Kangaroo Island, Mt Lofty and Flinders Ranges as far north as Hawker, and through the south-east of South Australia and into western Victoria as far east as Geelong. Records from Western Australia are misidentifications, probably of the very similar *D. brachyphylla*, which was previously placed within *D. brevifolia* as var. *ephedroides*.

**Habitat:**—Occurs in sandy, gravelly, loamy or ironstone soils, in a variety of habitats from dry, sandy ridges to semi-swampy land in *Eucalyptus*-dominated open forest or mallee or heath dominated by *Allocasuarina* and *Banksia*.

**Selected specimens (338 examined):**—**SOUTH AUSTRALIA. Eyre Peninsula:** SE end of Marble Range (ca. 45 km NW of Port Lincoln), 34°24'S, 135°34'E, *D.J.E. Whibley 1877*, 25 August 1967 (AD); 1.8 km NW of New West Road intersection along Flinders Highway, then 5.9 km WSW on road past Gleneagle Homestead, 34°45'S, 135°45'E, *J.D. Briggs 1183*, 15 September 1983 (AD, CBG). **Flinders Ranges:** Yourambulla, ca. 10 km S of Hawker, 31°57'S, 138°23'E, *N.N. Donner 543*, 3 September 1962 (AD, NY); near Spencers Gulf, *O.W. Sonder s.n.* (MEL 77743). **Lofty North:** Black Hills, ca. 15 km E of Burra, 33°41'S, 139°08'E, *N.N. Donner 4769*, 23 April 1974 (AD, CANB). **Lofty South:** Highbury East, sandy soil along Torrens Road, 34°51'S, 138°43'E, *T. Smith 173*, 3 September 1967 (AD); 8 km SE of Aldgate towards Mylor, 35°02'S, 138°44'E, *M.D. Crisp 1868*, 27 December 1975 (CBG, PERTH, US); 5 km S of Ashbourne, 35°17'S, 138°46'E, *D.J.E. Whibley 837*, 16 September



**FIGURE 107.** *Daviesia brevifolia*. A. Flowering branchlet. B. Inflorescence with floral parts removed, except calyces. C. Pod. A, B from *T. Smith 173*; C from *Crisp 1868*. Drawn by A.L. Prowse.

1962 (AD, PR, SI); Forest Range, ca. 30 km E of Adelaide, 34°55'S, 138°48'E, *J.B. Cleland s.n.*, 18 October 1947 (AD 96803494); Cox's Scrub National Park, ca. 55 km SSE of Adelaide, 35°20'S, 138°45'E, *B.C. Crisp 119*, 31 October 1971 (AD). **Kangaroo Island:** Vivonne Bay, opposite store on Main South Coast Road, 50 km E of Harriet River, 35°58'S, 137°11'E, *J.G. West 1305*, 27 December 1975 (CANB, NSW); Flinders Chase, Shackle Road by Breakneck River, ca. 13 km N of the Old Rocky River Homestead, 35°55'S, 136°38'E, *P.G. Wilson 669*, 3 November 1958 (AD, L). **Murray Basin:** Ferries-McDonald National Park, ca. 16 km SW of Murray Bridge, 35°13'S, 139°09'E, *J. Carrick 3392*, 22 August 1973 (AD, MEL); north end of Scorpion Springs Conservation Park, S of Pinnaroo, 35°30'S, 140°55'E, *D.E. Symon 8617B*, 22 October 1973 (AD). **South East:** Jip Jip Rocks, ca. 30 km NW of Padthaway, 36°23'S, 140°15'E, *T.R.N. Lothian 2866*, 22 August 1964 (AD). **VICTORIA. Northern Plains:** Big Desert, 13 km E of the South Australian Border and 35 km N of the Western Highway, 36°04'S, 141°09'E, *H.I. Aston 1025*, 30 September 1963 (MEL); County of Follett, *F.M. Reader s.n.*, 15 October 1905 (MEL 77770); Big Desert, Wyperfeld National Park, 35°32'S, 141°58'E, *P.D. Cheal s.n.*, 26 September 1978 (MEL 0541242A). **Western Plains:** Wimmera, *Davis s.n.*, 1890 (MEL 80991); Little Desert, N of East–West Access Track, 36°34'S, 141°32'E, *M.G. Corrick 6795 & P.S. Short*, 4 October 1980 (CANB, MEL). **Western Highlands:** Grampians, junction Victoria Valley Road and Harrops Track, *K. Czornij 506*, 15 August 1971 (AD, CANB); 3 km N of Dunkeld, NW base of Mt Sturgeon, 37°37'S, 142°20'E, *M.D. Crisp 7969 per C.E. & D.T. Woolcock*, 17 February 1987 (CBG, NSW); ca. 5.7 km along Range Road from main Casterton–Dartmoor road, 37°49'S, 141°20'E, *P.S. Short 1335*, 1 October 1981 (CANB, MEL).

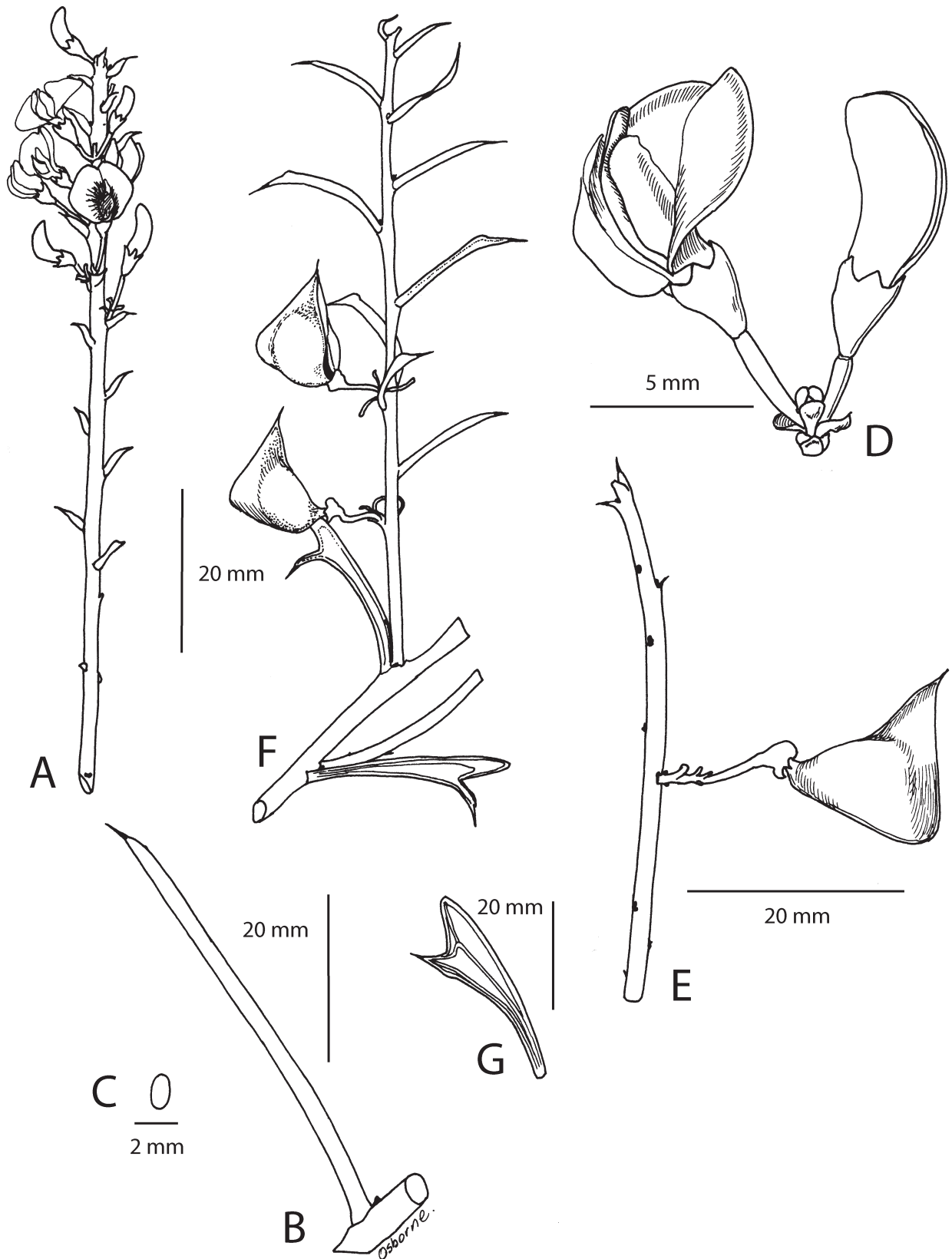
**Affinity:**—This species is similar to *Daviesia brachyphylla*, which differs in having phyllodes that are articulate and ± thickened at the base. Also, the juvenile phyllodes of *D. brachyphylla* are terete and not dilated upwards, the ribs on the calyx are less prominent and the upper 2 calyx lobes not united into a broad, truncate lip.

**107. *Daviesia brachyphylla*** Meisner (1844: 49), Crisp (1995: 1177). *Daviesia incrassata* Smith (1808b: 255) var. *brachyphylla* (Meisn.) Domin (1923: 34). Type: 'In planitie arenosa Quangen (Victoria) d. 20. Mart. Herb. Preiss. No. 1162. et in region. inter. Austr. merid.-occ., m. Nov. 1840. No. 1161. (Drummond n. 242.)' Lectotype (Crisp, 1995: 1177): *Drummond 242* (BM, ex Herb. Shuttleworth); isolectotype: G, K, (2 sheets). Syntype: *Preiss 1162*: LD, NY; isosyntype: G. Syntype: *Preiss 1161* (= *D. incrassata* subsp. *incrassata*): LD, NY; isosyntype: G (2 sheets)

Spreading to bushy *shrubs*, to 0.8 m tall, glabrous, glaucescent to glaucous. *Root anatomy* unknown. *Branchlets* arching to ascending, longitudinally wrinkled when dry, terete. *Phyllodes* scattered to rather crowded, diverging at 45–90°, terete with an acuminate slightly recurved tip, basally thickened and articulate, 1.5–30(–40) × 1–1.5 mm, smooth when fresh, longitudinally wrinkled when dry, sometimes reduced to scales on lower portion of branchlets or rarely (Fig. 108E) over the whole plant. *Juvenile phyllodes* and those at lower nodes of adult plants elongated up to 60 mm and flattened or compressed vertically, up to 2.5 mm broad. *Unit inflorescences* 1 per axil, racemose, appearing umbellate when only 1 or 2 flowers present, 1–6-flowered; *peduncle* from almost nil to 1.5 mm long; *rachis* from almost nil to 2.5 mm long; *barren basal bracts* numerous, clustered at base of peduncle, ca. 0.5 mm long; *subtending bracts* oblong, spreading at tips, ca. 1 mm long. *Pedicels* 1–4 mm long. *Calyx* 2.5–3.5 mm long including the ca. 1 mm receptacle; lobes ca. 0.5 mm long; upper 2 lobes united higher than the lower 3; lobes rounded. *Corolla: standard* transversely broadly elliptic to broadly ovate, emarginate, 7–8.5 × 6.5–8 mm including the 1–1.5 mm claw, strong central groove towards the base of the lamina, orange with apricot (pinkish) towards the margin, with a deep maroon centre and radiating veins, fading to yellow and grey; *wings* elliptic to obovate with a rounded apex, auriculate, 6–7 × 2–2.5 mm including the ca. 1.5 mm claw, dark pink; *keel* half very broadly to transversely very broadly ovate with a sharply incurved acicular beak, saccate, 7–7.5 × 1.75–2 mm including the 3–4 mm claw, red with a dark tip. *Stamens* slightly dimorphic: inner whorl of 5 with longer, more slender, less compressed filaments and shorter, versatile anthers; outer whorl of 5 with shorter, broader, more compressed filaments and longer, basifixed anthers; filaments cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular with an acute, pungent apex, very turgid, 10–12 × 7–8 mm; upper suture curved upwards or undulating; lower suture acute. *Seed* globose, 3.7–4.5 mm long, 2.8–3.5 mm broad, 2.4–3 mm thick, brown to olive green, sometimes mottled; *aril* 2.5–3 mm long. (Fig. 108).

**Flowering period:**—July to October. *Fruiting period:* November to January.

**Distribution:**—Western Australia, widely but sparsely distributed in the Darling Range and wheatbelt from east of Moora south-east through Hyden to the Ravensthorpe area.



**FIGURE 108.** *Daviesia brachyphylla*. A. Flowering upper branchlet with typical adult phyllodes. B. Elongate phyllode from lower part of adult plant. C. Transverse section of phyllode in B. D. Inflorescence. E. Fruiting branchlet with most phyllodes reduced to scales. *Daviesia physodes*. F. Fruiting branchlet showing transition from bilobed lower phyllodes to entire upper phyllodes. G. Intermediate phyllode from lower part of plant. A, D from *Crisp 6180*; B, C from *Crisp 5512*; E from *Crisp 4990*; F from *Chapman (89)77*; G from *Chapman (70)77*. Drawn by B-J. Osborne.



**Habitat:**—Grows in deep sand, sandy clay or sandy loam in mallee-heathland, low kwongan heathland or open *Eucalyptus wandoo* woodland.

**Selected specimens (29 examined):**—WESTERN AUSTRALIA. **Avon:** 3 km W of Quairading, 32°01'S, 117°22'E, *M.D. Crisp 6180 et al.*, 27 September 1979 (CBG, MO); Yoting rubbish tip, ca. 40 km SSW of Kellerberrin, 31°58'S, 117°35'E, *M.D. Crisp 5512*, 27 January 1979 (CBG, PERTH); No. 2 Rabbit Proof Fence, 4–5 km S of York–Tammin road, c 31°45'S, 117°15'E, *B. & M. Smith s.n.*, 7 October 1979 (PERTH 5146828); 8 km E of Piawaning, 30°51'S, 116°28'E, *T.E.H. Aplin s.n.*, 9 September 1959 (PERTH 5475643); 4 km N of Alderside, Corrigin–Brookton road, 32°20'S, 117°17'E, *M.D. Crisp 6185, et al.*, 27 September 1979 (CBG, MEL, PERTH).

**Darling:** Darling Range, 21 km SE along West Talbot Road, from Great Southern Highway turnoff 10 km E of The Lakes, 32°00'S, 116°35'E, *M.D. Crisp 6719a*, 26 July 1980 (AD, CBG, PERTH); West Talbot Road, 8 km E of Helena Road and 3.2 km W of Luelfs Road (=Gunapin Ridge Road), 32°00'S, 116°36'E, *M.D. Crisp 8516 & W. Keys*, 27 September 1993 (CBG, PERTH); ca. 37 km W of Beverley, Qualen Road, 5 km SW of intersection with Gunapin Ridge Road, 32°07'S, 116°32'E, *M.D. Crisp 6724*, 26 July 1980 (CBG). **Roe:** 7.5 km WSW of Lake Cronin, 32°23'S, 119°46'E, *T.F. Houston 203–13*, 25 October 1978 (PERTH); 20.6 km E of Newdegate, 33°05'S, 119°26'E, *J.W. Green 4481*, 27 September 1975 (PERTH); 17.5 km SE of Lake King township, Reserve 29860, 33°14'S, 119°43'E, *A.S. George 10495*, 12 November 1970 (CANB, PERTH). **Eyre:** 35 km SE of Lake King, 4 km NE along Hayes Road from Ravensthorpe to Lake King Road, 33°23'S, 119°56'E, *M.D. Crisp 4990*, 10 January 1979 (CBG).

**Affinity:**—*Daviesia brachyphylla* is similar to *D. brevifolia*, *D. incrassata* and *D. physodes*. *Daviesia incrassata* differs in having phyllodes not articulate at the base. *Daviesia brevifolia* differs by the adult phyllodes being ± constricted at the base (on the adaxial side) when dry but not articulate; also, the juvenile phyllodes are vertically compressed and dilated upwards, and the calyx is prominently ribbed with the upper 2 lobes united into a broad, truncate lip. *Daviesia physodes* differs in having all phyllodes vertically compressed or flattened and the lower phyllodes are bilobed and much broader (to 10 mm) than in *D. brachyphylla*.

**Variation:**—There is a long-leaved, often pruinose, form that grows in the Darling Range but is otherwise identical to the rest of the species (e.g. *Crisp 6719A, B* and *6724*).

**Hybrids:**—*D. brachyphylla* × *D. microphylla* (*Crisp 6725*).

**108. *Daviesia incrassata*** Smith (1808b: 255), Bentham (1864: 83), Crisp (1984: 167), (Crisp 1987a: 746), Crisp (1995: 1200), Wheeler *et al.* (2002: 746). Type: 'Found at King George's Sound, on the west coast of New Holland, by Mr. A. Menzies.' Holotype: King George Sound, west coast of New Holland, (at 35, *Menzies*, 1803 (LINN)); isotypes: BM (2 sheets), MO

*Acacia dolabriformis* H.L. Wendland (1820: 6). Type: 'Nec flores nec fructus vidi, sed tantum unicum specimen in Nova Hollandia lectum ...' Holotype: GOET.

*Daviesia reversifolia* Mueller (1859b: 145), Bentham (1864: 83). Type: 'In monte 'Flat-top Hill' juxta rivum Fitzgerald River. Mxw.' Holotype: MEL 80382; isotypes: K, ?MEL 80383.

Rounded to spreading *shrubs*, to 1 m high, glabrous, ± glaucous (to pruinose). *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending or divaricate, gently to strongly flexuose, trigonous to terete, smooth when fresh, wrinkled-striate when dry. *Phyllodes* scattered, trigonous to terete, spreading at 45–90° or (in subsp. *reversifolia*) retrorse, terete or vertically compressed or dilated, at least towards the base of the plant, inarticulate and sometimes decurrent, 5–15 mm long, smooth when fresh, wrinkled-striate when dry. *Juvenile phyllodes* vertically dilated and asymmetrically lobed (in subsp. *incrassata*), or not retrorse, gently incurved, vertically compressed but not lobed (in subsp. *reversifolia*), or strictly terete (in subsp. *teres*), up to 8 cm long. *Unit inflorescences* 1(2) per axil, racemose, 2–4-flowered; *peduncle* occasionally somewhat triquetrous, 0.5–3 mm long; *rachis* flexuose, 0.25–2 mm long; *subtending bracts* spreading to ascending, oblong, to 1 mm long. *Pedicels* dilating towards the apex, terete, 2–4.5 mm long. *Calyx* 2.5–3 mm long including the 0.75–1 mm receptacle; lobes shallowly triangular, subequal with broad, shallow sinuses, upper 2 united higher than the lower 3, 0.5–1 mm long. *Corolla: standard* transversely elliptic to obovate to broadly so, emarginate, with a central groove, 7–8 × 6.5–8 mm including the 1.5–2 mm claw, orange with pink infusion towards the margin, deep red to blackish centrally and on radiating veins, fading to yellowish and grey; *wings* elliptic with a rounded apex, auriculate, 6–7.5 × 1.5–2.5 mm including the 1.5–2 mm claw, deep pink; *keel* half very broadly to transversely broadly ovate with an acute, beaked

apex, auriculate, 7–7.5 × 2 mm including the 3–4.5 mm claw, pink with a blackish tip. *Stamens* weakly dimorphic: inner whorl of 5 with longer, narrower filaments and shorter, subdorsifixed anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; filaments all somewhat compressed, cohering towards base; anthers all 2-celled. *Pod* obliquely shallowly obtriangular with an acute to acuminate, beaked apex, turgid, 11–14 × 8–11 mm; upper suture undulate; lower suture acute. *Seed* not seen. (Figs 109, 110).

**Flowering period:**—June to November. *Fruiting period:* August to January.

**Distribution:**—Western Australia, widespread through the south-west from near Dongara to Mt Ragged, between the coast and the wetter (western and southern) fringes of the wheatbelt.

**Affinity:**—*Daviesia incrassata* is similar to *D. brachyphylla*, *D. inflata*, *D. physodes* and *D. retrorsa*. All four species are easily distinguished from *D. incrassata* by their articulate phyllode bases. *Daviesia inflata* also differs in having a bicoloured calyx, in which the margins of the lobes are distinctly paler than the rest. *Daviesia retrorsa* has phyllodes developed only towards the apex of the branchlets, smaller (9–11 mm long), less turgid pods, and the keel is neither incurved or beaked. *Daviesia brevifolia* has short, non-articulate phyllodes and is very similar to *D. incrassata* subsp. *teres*—see under the latter for distinguishing characters.

### 108a. *Daviesia incrassata* Sm. subsp. *incrassata*

Reference: Crisp (1995: 1200).

*Acacia dolabriformis* H.L. Wendland (1820: 6). Type: ‘Nec flores nec fructus vidi, sed tantum unicum specimen in Nova Hollandia lectum ...’ Holotype: GOET.

*Daviesia incrassata* Sm. var. *dorrienii* Domin (1923: 34). Type: ‘W.A.: Slab Hut Creek to Cranbrook, A.A. DORRIEN-SMITH.’ Lectotype (Crisp 1995: 1200): K; isoelectotype: PR.

*Daviesia incrassata* Sm. var. *typica* Domin (1923: 33). *Notes:* *nom. illeg.*, replaced by the autonym.

[*Daviesia colletioides* auct. non A.Cunn. ex Bentham (1837a: 75): Meisner (1844: 48), partly; Bentham (1864: 83), partly. Specimens cited: ‘In solo turfoso planitie prope oppidum Albany, d. 5. October 1840. Herb. Preiss. No. 1180 et in region. interior. Australiae meridionali-occid. No. 1163.’ Specimens seen: *Preiss 1180*: G (2 sheets), MO (partly), NY = *D. inflata*; G, LD, MO (partly) = *D. incrassata*; *Preiss 1163*: G, LD, S = *D. inflata*. Note: For a full discussion of the specimens seen and cited by Meisn. and of the identity of this material, see Crisp (1984).]

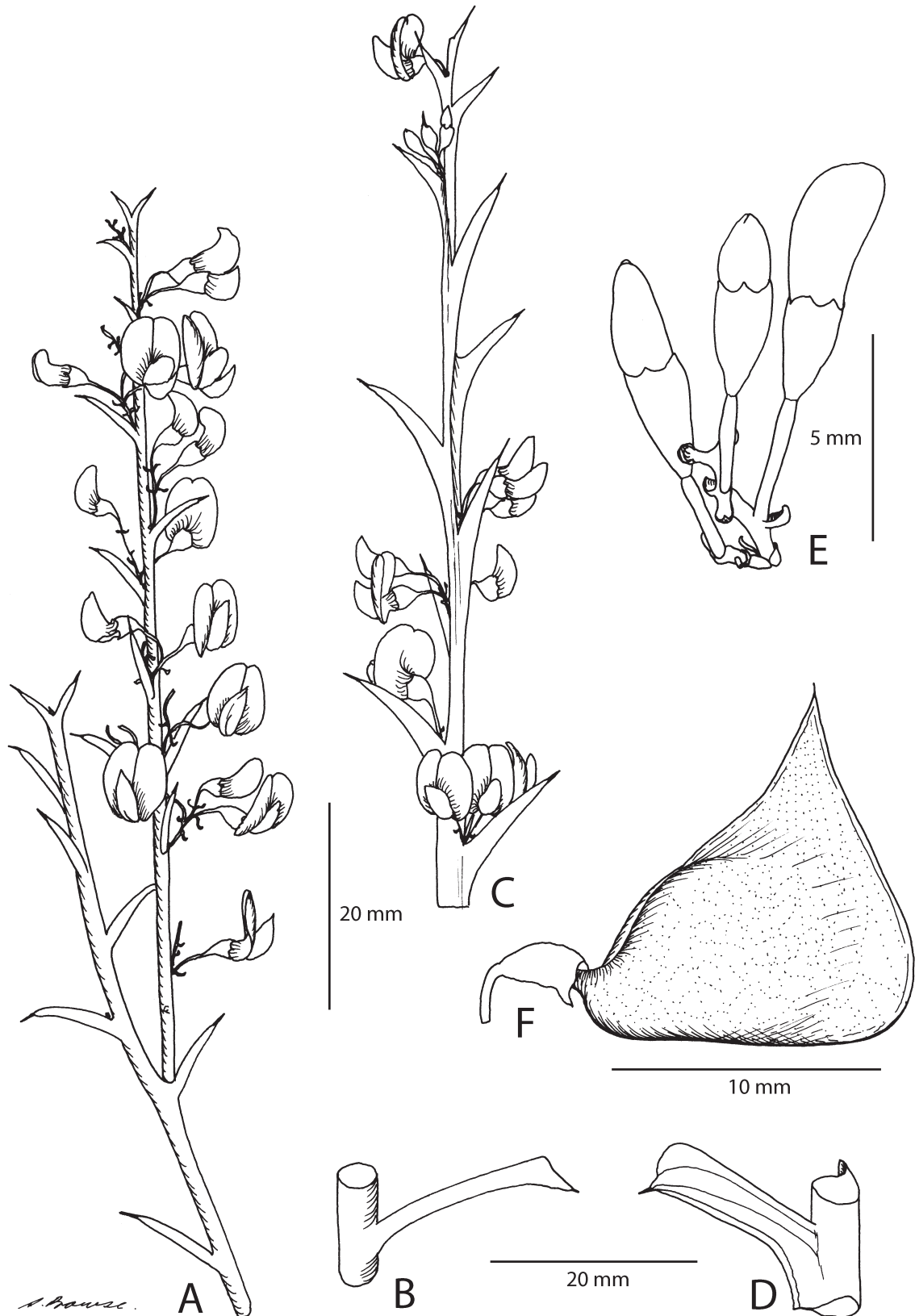
*Phyllodes* and *branchlets* trigonous, rarely becoming terete; branchlets gently flexuose; phyllodes diverging at 45–60(–80)°, vertically compressed or dilated, at least towards the base of the plant, mostly 5–15 mm long in the adult plant. *Juvenile phyllodes* vertically dilated and asymmetrically lobed, up to 5 cm long. (Fig. 109).

**Flowering period:**—July to October. *Fruiting period:* October to January.

**Distribution:**—Western Australia, as for the species.

**Habitat:**—Grows in a variety of substrates, e.g. in sand, laterite or seasonally swampy ground, in eucalypt forest, woodland or heath, *Allocasuarina* woodland or *Banksia* heath.

**Selected specimens (150 examined):**—**WESTERN AUSTRALIA. Irwin:** Wilcocks Road (off Green Head Road), 30°15'S, 115°30'E, *C. Chapman (16)78* and *(16b)78*, 30 July 1978 (CBG, PERTH). **Avon:** Nature reserve no. 16479, 20 km W of Kulin, cnr Fence and 86 Gate Roads, 32°37'S, 117°57'E, *J.M. Brown 027*, 12 October 1984 (CANB, PERTH). **Darling:** 16 km N of Kojonup on Albany Highway, 33°42'S, 117°07'E, *J.S. Beard 8196*, 26 October 1977 (PERTH); N of first rail crossing N of Mogumber, 30°45'S, 116°03'E, *C. Chapman (41)77*, 17 August 1977 (CBG, MEL); 1 km W of Brand Highway on Mimegarra road, 30°42'S, 115°34'E, *R.J. Hnatiuk 760020*, 3 August 1976 (PERTH); 27 km N of Collie, near the Harris River, 33°09'S, 116°09'E, *M.D. Crisp 1035*, 12 August 1975, juvenile (CBG); 5 km from Collie along road to Mumballup, 33°23'S, 116°10'E, *M.D. Crisp 5368*, 21 January 1979 (CBG); Albany Highway, 21 km S of Mt Barker, 34°48'S, 117°44'E, *M.D. Crisp 1021*, 11 August 1975 (CBG). **Roe:** Near Commander Rocks, ca. 20 km SSW of Lake King township, 33°14'S, 119°34'E, *P.G. Wilson 6983*, 10 August 1968 (CANB, PERTH); 14 km E of Lake King, 33°05'S, 119°50'E, *D. Young 132*, 15 June 1967 (PERTH); 50 km W of Lake Grace, 33°11'S, 117°57'E, *C.E. Woolcock D104*, 27 July 1981 (CBG); Lake King, 33°05'S, 119°41'E, *C.E. Woolcock D40*, 28 July 1981 (CBG). **Eyre:** Ca. 60 km NE of Albany, 2.5 km NE of South Stirling, 34°34'S, 118°14'E, *M.D. Crisp 6132 et al.*, 25 September 1979 (CBG, MEL, US); 80 km from Israelite Bay along road to Esperance, 2 km SE of Boyatup Hill, 33°45'S, 123°02'E, *M.D. Crisp 4915*, 7 January 1979 (CBG); Boxwood Hills to Toompup road, 12 km NW of Chillilup Pool turn-off, 34°16'S, 118°30'E, *M.D. Crisp 6138 et al.*, 22 September 1979 (BM, CBG, NSW, PERTH); 3 km N of Duke of Orleans Bay, 33°52'S, 122°38'E, *P.G. Wilson 8111*, 28 September 1968 (CANB, PERTH).



**FIGURE 109.** *Daviesia incrassata* subsp. *incrassata*. A. Flowering branchlet with terete upper phyllodes. B. Lower phyllode from the same plant, showing vertical dilation. C. Flowering branchlet with vertically compressed phyllodes. D. Lower phyllode from the same plant, showing pronounced vertical dilation. E. Inflorescence. F. Pod. A, B from *Crisp 6132*; C, D from *Chapman (16)78*; E from *Crisp 1021*; F from *Crisp 5368*. Drawn by A.L. Prowse. Adapted from *Crisp (1995)* with permission from CSIRO Publishing.

**Affinity:**—Subsp. *teres* differs in having terete branchlets and phyllodes at all stages of development. Subsp. *reversifolia* differs in the markedly flexuose, divaricating branchlets, and in the patent or reflexed phyllodes. This subspecies interrupts the geographic continuity of subsp. *incrassata* along part of the south coast of WA, between Bremer Bay and Esperance. Subspecies *incrassata* is highly variable in the coarseness of the vegetative parts and the angularity of the stems.

**108b. *Daviesia incrassata* Sm. subsp. *reversifolia* (F.Muell.) Crisp (1995: 1201).** *Daviesia reversifolia* Mueller (1859: 145), Bentham (1864: 83). Type: 'In monte 'Flat-top Hill' juxta rivum Fitzgerald River. Mxw.' Holotype: MEL 80382; isotypes: K, ?MEL 80383

*Branchlets* terete, strongly flexuose. *Phyllodes* reflexed or spreading at 90°, terete, mostly 5–15 mm long in the adult plant. *Juvenile phyllodes* not retrorse, gently incurved, vertically compressed but not lobed, up to 8 cm long. (Fig. 110A–C).

**Flowering period:**—July to November. *Fruiting period:* October and November.

**Distribution:**—This subspecies extends along the south coast and adjacent hinterland of Western Australia from Bremer Bay to Esperance. A specimen from Kangaroo Island, South Australia (*Tate s.n.*, AD 968010180) definitely belongs to this taxon. However, the locality requires verification, given the lack of precise locality details and a large disjunction from the nearest occurrence in WA.

**Habitat:**—Grows in sand or rocky soil in mallee-heath or kwongan heath.

**Selected specimens (59 examined):**—WESTERN AUSTRALIA. **Roe:** East of Jerramungup, *C.E. Woolcock D45*, 31 July 1981 (CBG). **Eyre:** 404 mile-[post], Esperance–Ravensthorpe Road, 33°43'S, 120°58'E, *E.M. Bennett 919*, 11 September 1966 (PERTH); 1 km E of Lort River, on Ravensthorpe–Esperance road, 33°45'S, 121°16'E, *E.M. Canning WA/68 7202*, 5 November 1968 (CBG); 80 km W of Esperance, 33°47'S, 121°05'E, *R.D. Royce 3642*, 12 August 1951 (PERTH); 56 km W of Esperance towards Ravensthorpe, 33°44'S, 121°20'E, *J.H. Willis s.n.*, 2 September 1947 (MEL 80386); 80 km W of Esperance towards Ravensthorpe, 33°47'S, 121°05'E, *P.G. Wilson 7830*, 25 September 1968 (CANB, PERTH); 100 km from Esperance along road to Ravensthorpe, 6 km E of Munglinup River crossing, 33°43'S, 120°56'E, *M.D. Crisp 4931*, 8 January 1979 (CBG, PERTH); 26 km E of Hopetoun, 33°57'S, 120°24'E, *M.E. Phillips 3055*, 2 November 1962 (CBG).

**Affinity:**—This subspecies is easily distinguished from the others by its very tangled, intricate habit, zigzag branchlets and patent to strongly reflexed phyllodes. Around the distributional limits of subsp. *reversifolia*, occasional intermediates with subsp. *incrassata* are found, e.g. *Crisp 5095* (Fig. 110D, E).

**108c. *Daviesia incrassata* Sm. subsp. *teres* Crisp (1995: 1203).** Type: Western Australia, Irwin, 26 miles [41.5 km] W of Coorow, *C.H. Gittins 1686*, September 1967. Holotype: NSW; isotypes: BRI, CBG

*Branchlets* strictly terete (even in juvenile plants), gently flexuose. *Phyllodes* spreading at 45–80(–90)°, strictly terete (even in juvenile plants), mostly 5–10 mm long in the adult plant, up to 8 cm in the juvenile plant. (Fig. 110F, H).

**Flowering period:**—June to September. *Fruiting period:* August to November.

**Distribution:**—Western Australia, north of Perth from between Mullewa and Morowa south to Mogumber and inland to the Lake Grace–Kulin region of the wheatbelt.

**Habitat:**—Grows in sand, sand over limestone or on the edge of salt pans in mallee-heath or kwongan heath.

**Selected specimens (30 examined):**—WESTERN AUSTRALIA. **Irwin:** 8 km WSW of Winchester, 29°48'S, 115°52'E, *C. Chapman (120)77*, 12 November 1977 (CBG); 16 km from Three Springs on Eneabba Road, 29°37'S, 115°38'E, *C. Chapman (73)77*, 18 September 1977 (CBG, PERTH); 21 km W of Arrino, 29°24'S, 115°28'E, *C. Chapman (50)77*, 21 August 1977 (CBG, PERTH); 32 km W of Arrino, *C. Chapman (54)77*, 21 August 1977 (CBG, MEL); 10 km W of Brand Highway along Green Head Road, 30°05'S, 115°14'E, *M.D. Crisp 5427*, 24 January 1979 (CBG); Tompkins Road, 10.2 km W from Natta Road, 40 km due NNW of Eneabba, 29°28'S, 115°23'E, *N. Hoyle 151*, 10 September 1985 (CANB, PERTH).

**Affinity:**—This subspecies differs from subsp. *incrassata* by its terete phyllodes and branchlets, both juvenile and adult, and it differs from subsp. *reversifolia* by its non-reflexed phyllodes and by its terete juvenile phyllodes. In both the other subspecies, the juvenile phyllodes are vertically flattened. Also, the flowers of subsp. *teres* appear to be slightly larger than in subsp. *incrassata*, e.g. the standard is ca. 8 mm broad (vs. ca. 7 mm), and the keels are slightly different in shape. However, variation in flowers of subsp. *incrassata* has not been investigated thoroughly yet.



**FIGURE 110.** *Daviesia incrassata* subsp. *reversifolia*. A. Adult fruiting branchlet. B. Flowering branchlet showing developmental sequence of phyllodes from base (juveniles) to tip (adults). C. Juvenile phyllode enlarged. Intermediate between *D. incrassata* subsp. *reversifolia* and subsp. *incrassata*. D. Adult branchlet. E. Juvenile phyllode showing vertical dilation. *Daviesia incrassata* subsp. *teres*. F. Flowering adult branchlet. G. Juvenile branchlet. H. Pod. A from *Crisp 4931*; B, C from *Bennett 919*; D, E from *Crisp 5095*; F from *Gittins 1686* (type); G from *Crisp 5427*; H from *Chapman (108)77*. Drawn by A.L. Prowse. Adapted from *Crisp (1995)* with permission from CSIRO Publishing.

Subsp. *teres* may be confused with *D. brachyphylla* or *D. retrorsa* but differs from both in having the phyllodes continuous with the branchlet, never articulate at the base. *Daviesia brevifolia*, which is endemic in eastern Australia, has continuous phyllodes (no articulation), which differ in being constricted on the adaxial side at the base and slightly dilated upwards, especially in juvenile plants.

**109. *Daviesia physodes*** A.Cunn. ex Don (1832: 125), Crisp (1984: 167), Crisp (1987a: 252), Crisp (1995: 1221), Wheeler *et al.* (2002: 745). Type: 'Native of New Holland...Clt. 1824.' Lectotype (Crisp 1984: 167): Swan River, *A. Cunningham* (G); isolectotype: E, FI-W, K, OXF

Open *shrubs*, to 1.8 m tall, glabrous, usually glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, erect or occasionally arching, terete, smooth when fresh. *Phyllodes* moderately crowded, divaricate or ascending,  $\pm$  recurved, articulate at base, smooth when fresh, longitudinally wrinkled when dry, venation prominent on broader phyllodes; lower (proximal) phyllodes vertically flattened, cuneate with a bilobed apex, asymmetric with the upper lobe rounded, and lower lobe recurved to reflexed and acicular, up to  $55 \times 10$  mm; upper (distal) phyllodes becoming entire, subulate, pungent, to  $22 \times 3$  mm. *Seedling phyllodes* ascending, recurved, pungent, at first 4 or 5 nodes small (up to  $10 \times 2$  mm), then at higher nodes becoming large (up to  $20 \times 8$  mm), 2-lobed and with venation prominent, base cuneate and articulate. *Unit inflorescences* 1 per axil, racemose, 2–4-flowered; *peduncle* ca. 0.5 mm long; *rachis* ca. 0.25–0.5 mm long; *subtending bracts* spreading, spatulate, keeled, hooded, ca. 1 mm long. *Pedicels* 1.5–3 mm long. *Calyx* ca. 1.75 mm long including the ca. 0.25 mm receptacle; upper 2 lobes united into a truncate lip; lower 3 lobes shallowly to very shallowly triangular, ca. 0.25 mm long. *Corolla: standard* very broadly ovate, emarginate, cordate, ca.  $7 \times 8$  mm including the 1.5 mm claw, with a prominent central groove, yellow suffused with pink, with a blackish centre, fading with age; *wings* obovate with a rounded and incurved apex enclosing the keel, auriculate,  $5.5\text{--}6 \times 2.5$  mm including the 1.5 mm claw, pink to red; *keel* half transversely broadly ovate, beaked, auriculate, saccate, ca.  $7\text{--}7.5 \times 2$  mm including the 3.5–4 mm claw, pink to red. *Stamens* weakly dimorphic: inner whorl of 5 with longer, thinner filaments and shorter, versatile anthers; outer whorl of 5 with shorter, broader filaments and longer, slender, basifixed anthers; filaments very broad and compressed towards the base, firmly cohering into a tube except upper quarter; anthers all 2-celled. *Pod* obliquely shallowly to very shallowly obtriangular, beaked, swollen,  $11\text{--}16 \times 9\text{--}11$  mm; upper suture slightly sigmoid to recurved; lower suture acute. *Seed* ellipsoid, 3.3–4.5 mm long, 2–3.5 mm broad, ca. 1.5 mm thick, black; aril 2–2.2 mm long. (Fig. 108F, G).

**Flowering period:**—July to November. *Fruiting period:* September to January.

**Distribution:**—Western Australia, coastal plains and the Darling Range, from Geraldton south to Augusta and east to Narrogin.

**Habitat:**—Grows in sandy soils in *Eucalyptus* dominated open forest or *Banksia*-dominated kwongan shrubland.

**Selected specimens (128 examined):**—WESTERN AUSTRALIA. **Irwin:** 13 km WSW of Winchester,  $29^{\circ}47'S$ ,  $115^{\circ}47'E$ , *C. Chapman* (58)77, 24 August 1977 (CBG, PERTH); Geraldton,  $28^{\circ}46'S$ ,  $114^{\circ}37'E$ , *Dr. Stoward s.n.*, September 1917 (PERTH 5202205). **Avon:** Mt Pleasant,  $31^{\circ}33'S$ ,  $116^{\circ}37'E$ , *K. Newbey s.n.*, 29 August 1963 (PERTH 5197880); Upper Swan River, *Sewell s.n.*, 1883 (MEL 81348). **Darling:** 11.5 km from Bussell Highway to Ambergate, *E.M. Bennett 1284*, 21 September 1966 (PERTH); 18 km from Busselton along road to Margaret River, 1 km S of Carburnup River,  $33^{\circ}43'S$ ,  $115^{\circ}10'E$ , *M.D. Crisp 5365*, 21 January 1979 (CBG); N of 40 mile peg Perth–Moora Road,  $31^{\circ}30'S$ ,  $116^{\circ}05'E$ , *C. Chapman* (70)77, 1 September 1977 (CBG, MO); N of Perth along Geraldton Highway, ca.  $31^{\circ}30'S$ ,  $115^{\circ}59'E$ , *C. Chapman* (89)77, 27 September 1977 (CBG, PERTH); Busselton–Bunbury Road area, *L.J. Webb 2941*, 26 August 1958 (BRI); ca. 45 km N of Perth, Muehea,  $31^{\circ}35'S$ ,  $115^{\circ}58'E$ , *M.D. Crisp 6206, et al.*, 29 September 1979 (CBG, L, MEL, PERTH).

**Affinity:**—*Daviesia physodes* could be confused with *D. brachyphylla*, *D. incrassata* and *D. inflata*. *Daviesia incrassata* differs in always having basally non-articulate phyllodes. *Daviesia brachyphylla* can be distinguished by its terete adult phyllodes. Adult plants of *D. physodes* can usually be diagnosed by the presence of intermediate phyllodes that are dilated upwards and bilobed, though when these are absent (e.g. *Crisp 6206* and *Chapman* (58)77), the plant can be difficult to distinguish from *D. brachyphylla*. Moreover, the upper phyllodes of *D. physodes* often appear terete, also confusing identification, though upon closer examination, most are actually slightly vertically compressed. Upper phyllodes of *D. brachyphylla* are always terete and typically 1.5–3 mm long,

i.e. shorter than those of *D. physodes*. Occasionally, the lower phyllodes of *D. brachyphylla* can be up to 60 mm long and slightly compressed. The articulate phyllodes immediately distinguish *D. physodes* from *D. incrassata*, which has decurrent phyllodes. *Daviesia inflata* can be distinguished from *D. physodes* by the strictly terete phyllodes that are not dilated towards the apex, the calyx being dark with paler margins, and by the standard colour, which is orange-red with a slight pink infusion towards margins, dark red towards centre, and with a central vertical yellow guide mark.

**110. *Daviesia inflata*** Crisp (1984: 165), Crisp (1987a: 251), Crisp (1995: 1203), Wheeler *et al.* (2002: 745). Type: 'ca. 0.5 km S of Brennan Ford crossing of Scott River, ca. 11 km ENE of Augusta, 34°16'S, 115°16'E, 12 September 1977, W. R. Barker 2329, fl.' Holotype: CANB; isotypes: AD, K, PERTH

*Daviesia incrassata* Smith (1808b: 255) var. *cylindrica* Domin (1923: 34). Type: Not designated, specimen unknown—despite a search at K and enquiries at both PR and PRC, no type of this name has been located. The description is too brief for positive application of the name, but it could be *D. inflata*.

[*Daviesia collettioides* auct. non A.Cunn. ex Bentham (1837a: 75): Meisner (1844: 48), partly; Bentham (1864: 83), partly. Specimens cited: 'In solo turfoso planitie prope oppidum Albany, d. 5. October 1840. Herb. Preiss. No. 1180 et in region. interior. Australiae meridionali-occid. No. 1163.' Specimens seen: *Preiss 1180*: G (2 sheets), MO (partly), NY = *D. inflata*; G, LD, MO (partly) = *D. incrassata*; *Preiss 1163*: G, LD, S = *D. inflata*. Note: For a discussion of the specimens seen and cited by Meisner and of the identity of this material, see Crisp (1984).]

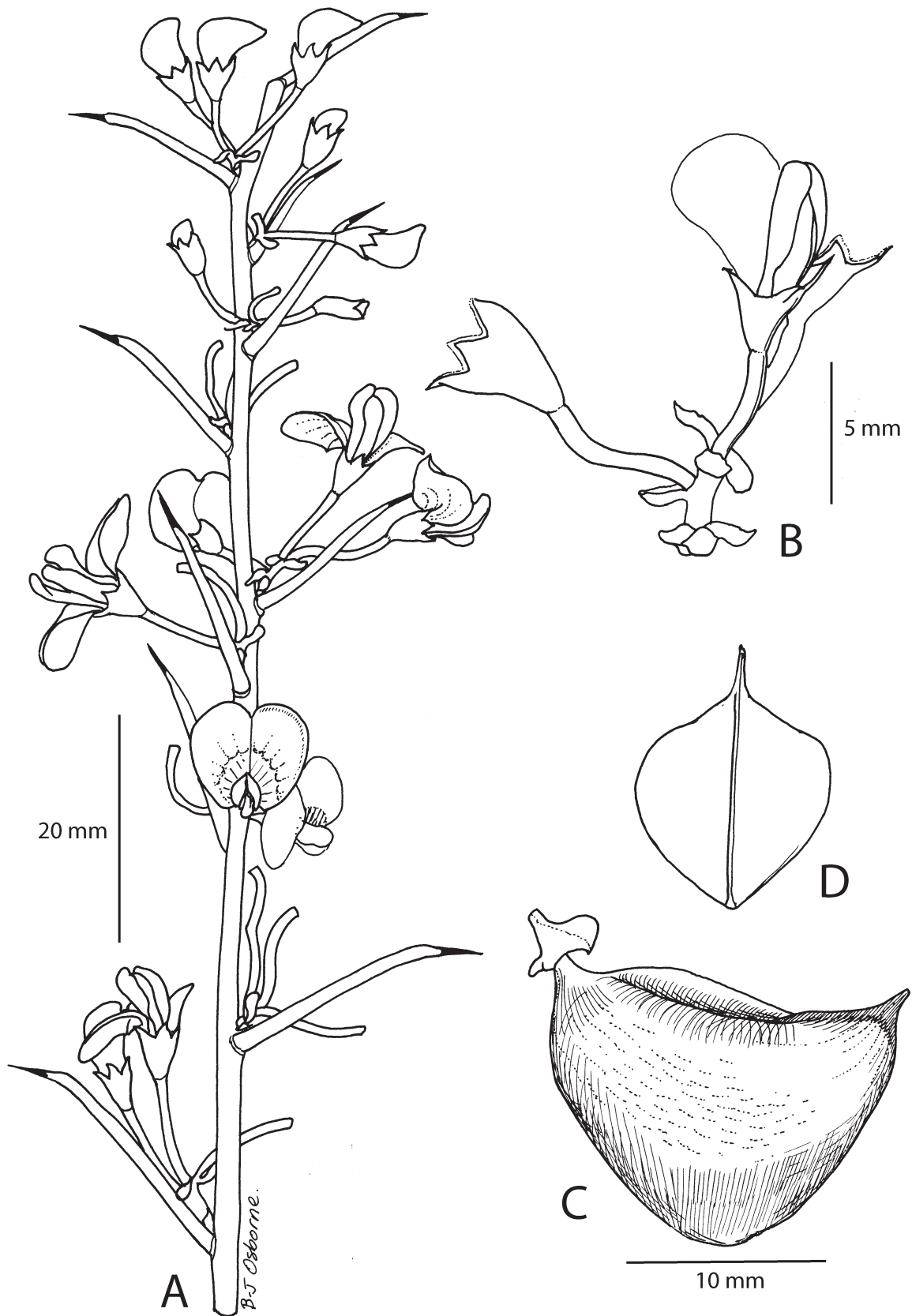
*Shrubs* with many ± ascending, sparsely branched stems to 1 m tall, glabrous, green. *Root* resembling a carrot in external morphology; *root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete, lightly ribbed, longitudinally wrinkled when dry, frequently galled. *Phyllodes* scattered, diverging at ca. 45°, terete with an acicular slightly recurved apex, pungent, articulate at base, 5–80(–110) mm long, 0.5–1.5 mm diam., smooth when fresh, longitudinally wrinkled when dry. *Unit inflorescences* 1 per axil, racemose, 2–5-flowered; *peduncle* 1.5–3.5 mm long; *rachis* 1–5 mm long; *subtending bracts* spreading, spatulate, 1–1.5 mm long. *Pedicels* 3–9 mm long. *Calyx* 4–4.5 mm long including the ca. 1.5 mm receptacle, green with a variable infusion of lead grey at least around bases of lobes or sometimes all over; margins of lobes distinctly paler; upper 2 lobes united in a narrow lip, ca. 1 mm long; lower 3 lobes broadly or very broadly triangular, ca. 1 mm long. *Corolla: standard* very broadly obovate, emarginate, cordate, 10–11 × 9–11 mm including the 1.5–2 mm claw, with a slight basal channel, orange-red with a slight pink infusion towards margins, dark red towards centre, with a vertical yellow guide mark at centre; *wings* obliquely obovate, auriculate, 7.5–8.5 × 3–3.5 mm including the 2–2.5 mm claw, dark red; *keel* ovate, falcate, obtuse, auriculate, 7.5–8.5 × 2–2.5 mm including the 4–4.5 mm claw, dark red. *Stamens* strongly dimorphic: inner whorl of 5 with longer filaments and shorter, subdorsifixed anthers; outer whorl of 5 with shorter, broader filaments and longer, basifixed anthers; filaments all compressed and overlapping; anthers all 2-celled. *Pod* obliquely shallowly to very broadly obtriangular, inflated, beaked, bladderly when immature, brittle when mature, 15–18 × 11–15 mm; upper suture slightly invaginated; lower suture acute. *Seed* ellipsoid, ca. 5 mm long, 2.5 mm broad, 2.25 mm thick; *aril* thickly lobed, obovate in outline, ca. 2–2.5 mm long. (Fig. 111).

**Flowering period:**—September and October. *Fruiting period:* December and January.

**Distribution:**—Western Australia, near the coast from Harvey south to Augusta and east to the Pallinup River.

**Habitat:**—Grows frequently on sandy clay or peat on swampy flats which are inundated in winter, in heath dominated by sedges and *Melaleuca*; also on higher ground on hard laterite in jarrah (*Eucalyptus marginata*) forest.

**Selected specimens (71 examined):**—WESTERN AUSTRALIA. **Darling:** Near Nannup, SE of Busselton, ca. 33°58'S, 115°46'E, *A.M. Ashby 2375*, 13 October 1967 (PERTH); 42 km from Augusta on Manjimup road, 34°10'S, 115°21'E, *E.M. Bennett 2838*, 19 December 1968 (PERTH); 68 km from Pemberton along road to Nannup, 34°03'S, 115°46'E, *M.D. Crisp 5354*, 21 January 1979 (CBG, MEL, PERTH); ca. 40 km W of Albany, Hay River Bridge, 34°58'S, 117°28'E, *M.D. Crisp 6092, et al.*, 24 September 1979 (CBG, L, MEL, MO, NSW, PERTH); 5 km E of Nannup on Pemberton Road, 34°02'S, 115°46'E, *A.R. Fairall 842*, 19 October 1962 (PERTH); Yallingup Nature Reserve, 33°42'S, 115°06'E, *R. Pullen 9852*, 6 December 1974 (CANB, CBG); 15.5 km from Denmark along South Coast Highway to Albany, 34°59'S, 117°31'E, *A. Strid 20429*, 23 September 1982 (C, CBG, K, PERTH).

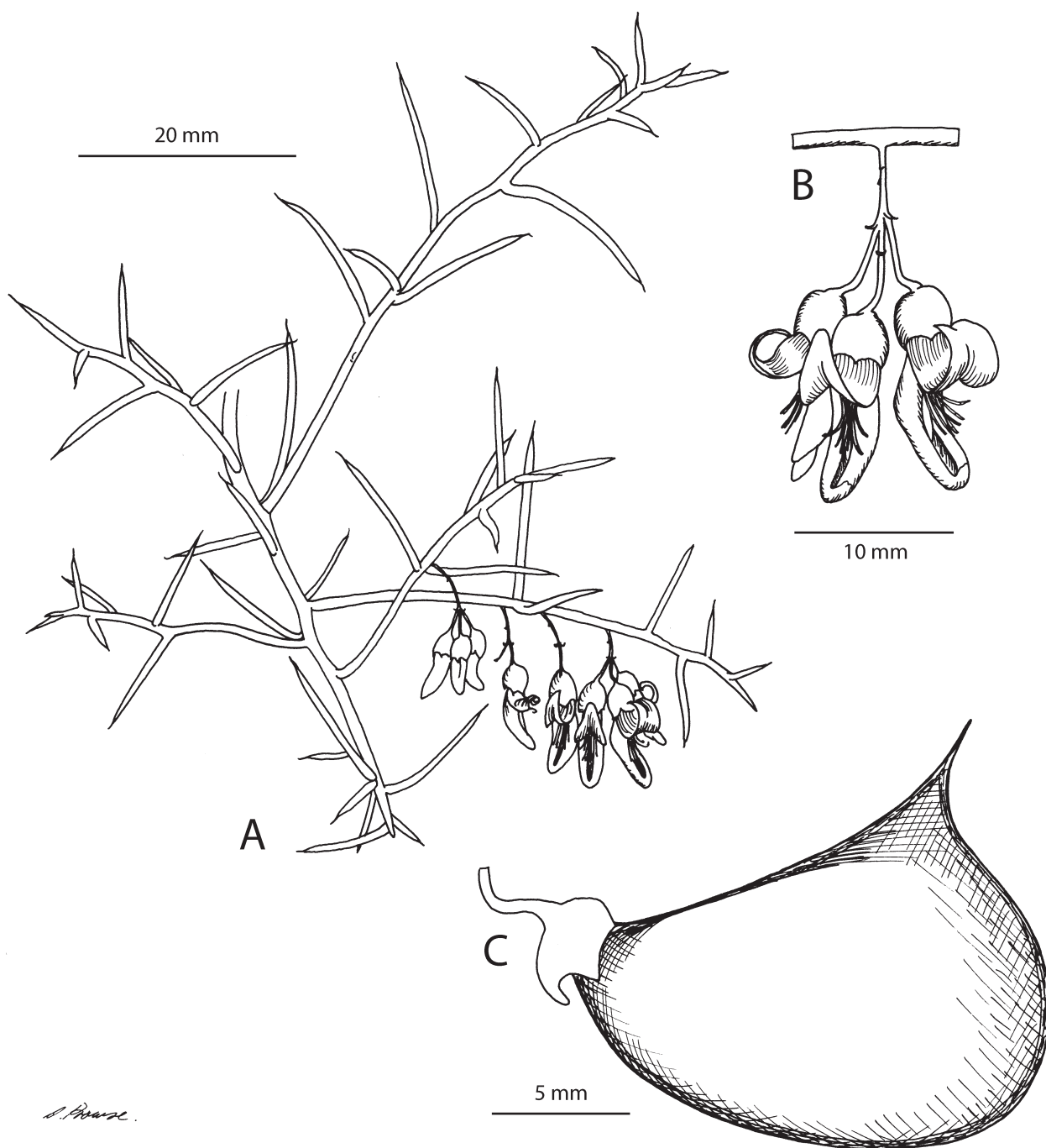


**FIGURE 111.** *Daviesia inflata*. A. Flowering branchlet. B. Inflorescence. C. Pod, lateral view. D. Pod viewed from distal end. A from Ashby 2375; B from Crisp 6092; C, D from Crisp 5354. Drawn by B-J. Osborne.



**Affinity:**—*Daviesia inflata* is similar to *D. incrassata* and *D. physodes*. *Daviesia incrassata* is easily distinguished by its phyllode bases being continuous with the branchlets. Both species may be distinguished from *D. inflata* by their uniformly coloured calyces without paler margins, and by the lamina of the standard having no paler central guide mark. Also, in both other species, the phyllodes are frequently vertically compressed, becoming dilated or lobed at the apex.

**111. *Daviesia glosseosema*** Crisp (1995: 1194). Type [approximate locality data given because the species is rare]: Western Australia, Eyre, Stirling Range, 34°20'S, 118°20'E, *M.D. Crisp 6121, J. Taylor & R. Jackson, 25 September 1979*. Holotype: CBG; isotypes: CANB, K, MEL, MO, NSW, PERTH



**FIGURE 112.** *Daviesia glosseosema*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 6221* (type); C from *Crisp 5269*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Intricate *shrubs*, 0.5–1(–1.5) m high, minutely scabrid, glaucous. *Root anatomy* unknown. *Branchlets* divaricate, arching, terete, striate when fresh, ribbed when dry. *Phyllodes* scattered, diverging at (45–)60–90°, terete, ± gently recurved from the base with an acuminate pungent apex, basally articulate, 8–40 × 0.75(–1) mm, scarcely rigid, faintly striate when fresh, ribbed when dry. *Unit inflorescences* 1 per axil, racemose, pendulous, umbelliform, 2–5-flowered; *peduncle* 4–7 mm long; *rachis* 1–3 mm long; *barren basal bracts* few, spreading to ascending, scattered along peduncle, ca. 0.5 mm long; *subtending bracts* spreading, oblong, ca. 1 mm long. *Pedicels* bent so that flowers face outwards, 3–5 mm long. *Calyx* obliquely cup-shaped, adaxially ventricose, ca. 4 mm long and broad, including the ca. 1.25 mm receptacle; teeth minute, uniform. *Corolla* maroon, paler with dark red spots in longitudinal lines towards the base; *standard* ovate, tongue-like, very strongly recurved, channelled, 10–10.5 × 5–6 mm including the 1.5–2 mm claw; *wings* with margins involute and apices strongly incurved and interlocked to form a U-shape (viewed from above), exposing the keel and stamens, 11.5–13.5 × 3 mm including the 2.5–3 mm claw; *keel* half very broadly obovate, much shorter than wings, scarcely acute, with claw longer than laminas, soon opening to display stamens and style, saccate, 8.5 × 1.75–2 mm including the 4.5–5 mm claw. *Stamens* weakly dimorphic, at anthesis splayed in the gap between standard and wings; inner whorl of 5 with narrower, terete filaments and slightly shorter, subversatile anthers; outer whorl of 5 with broader, compressed filaments and slightly longer, subbasifixed anthers; filaments free, ca. equal in length, all broader towards the base; anthers all 2-celled. *Gynoecium* almost straight. *Pod* obliquely shallowly to rarely very broadly obtriangular with an acuminate apex, very turgid, 14–20 × 10–12 mm; upper suture curved gently upwards; lower suture acute, ventricose and protruding beyond apex. *Seed* not seen. (Fig. 112).

**Flowering period:**—September to November. *Fruiting period:* October to December.

**Conservation status:**—National: Critically Endangered. WA: Critically Endangered, Declared Rare Flora.

**Distribution:**—Endemic to the Stirling Range, Western Australia.

**Habitat:**—Grows on loamy sand with quartz pebbles on a gentle footslope of the range, in mallee-heath or closed-heath dominated by *Eucalyptus marginata*, *E. staeri*, *Banksia* spp., *Hakea* pp., *Lambertia*, *Taxandria*, sedges and other Fabaceae.

**Selected specimens (7 examined):**—Approximate locality data are given because the species is rare.

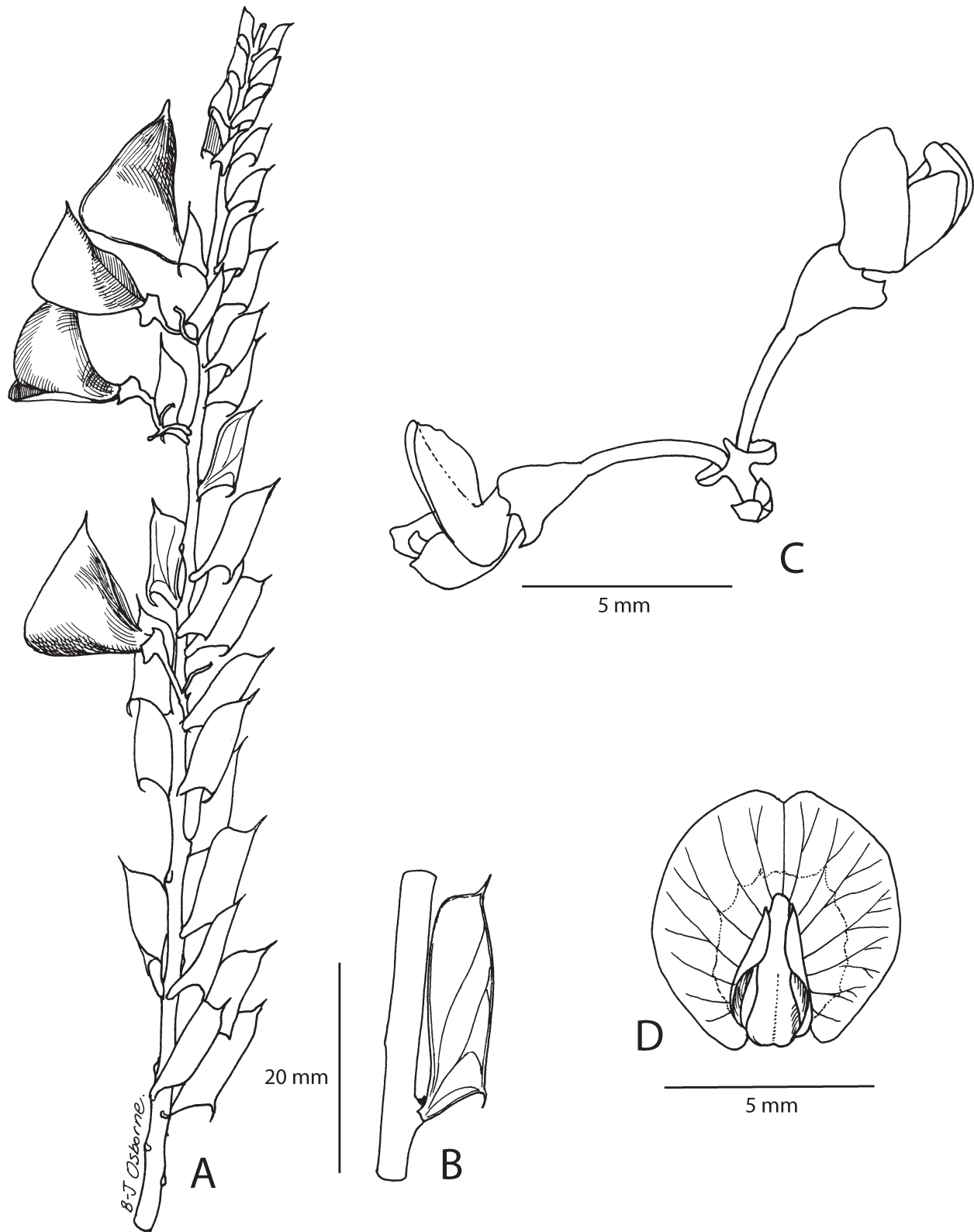
**WESTERN AUSTRALIA.** **Eyre:** Stirling Range, 34°20'S, 118°20'E, *M.D. Crisp 5269*, 18 January 1979 (CBG); *ibid.*, *S. Barrett 881*, 12 October 2000 (PERTH); Stirling Range, 34°20'S, 118°10'E, *S. Barrett 883*, 11 October 2000 (PERTH).

**Affinity:**—This species has remarkable flowers that cannot be confused with those of any other species in the genus. The pendulous inflorescence, maroon petals and strange shapes of the floral parts, as well as the exposure of the stamens and style at anthesis, are unique and suggest a specialised adaptation to an unusual pollinator. The reddish flower colour is reminiscent of some bird-pollinated *Gastrolobium* species (Crisp 1994, Toon *et al.* 2014) but the floral morphology is quite different. The small size of the flowers and the open brush arrangement of the stamens suggest an insect pollinator, possibly flies. Additionally, the very large, turgid pod is like that of no other species, except *D. inflata*, which is easily distinguished by its conventionally shaped, orange-red, bee-pollinated flowers. On the other hand, the vegetative form of *D. glossosema* is unremarkable compared with closely related species *D. brachyphylla*, *D. incrassata* and *D. physodes* (Fig. 1B). However, the minutely scabrous epidermis distinguishes it from all these.

**112. *Daviesia podophylla*** Crisp (1984: 164), Crisp (1987a: 252), Crisp (1995: 1221). Type: 47 miles [75 km] W of Coorow on Coorow–Green Head Road, *R.J. Cranfield 273*, 21 July 1978, fl. Holotype: CBG; isotypes: A, CANB, MEL, MO, NFLD, NSW, PERTH, UWA

[*Daviesia quadrilatera* Benth. in Lindley (1839: xiv), partly, *non sens. str.*—Crisp (1984: 164) found that the type material of *D. quadrilatera* comprised two species, one of which he segregated as *D. podophylla*.]

Divaricately branched *shrubs*, to 1 m tall and 2 m broad, glabrous, glaucous to pruinose. *Root anatomy* anomalous (cord roots). *Branchlets* numerous, diverging at 30–45°, short (5–20 cm long), terete, often spinescent, smooth when fresh, striate when dry, pruinose. *Phyllodes* fairly crowded, erect, vertically flattened, obliquely quadrilateral or triangular, pungent at apex, with a reflexed spine terminating a broadly triangular lobe on the abaxial margin near the base (rarely with 1 or 2 extra small spines on the adaxial margin), contracted at the base to a short (1–2 mm) pseudo-petiole, articulate, to 25 × 8 mm, smooth when fresh, with raised anastomosing veins



**FIGURE 113.** *Daviesia podophylla*. A. Fruiting branchlet. B. Lower phyllode, showing detail. C. Inflorescence. D. Flower, adaxial view. A from Chapman (118)77; B from Morrison s.n. (AD 96344252); C, D from Chapman s.n. (CBG 8302561). Drawn by B-J. Osborne.

when dry, glaucescent. *Seedling phyllodes* very broadly obtriangular, pungent at both apices, ca. 15 × 12 mm. *Unit inflorescences* 1 per axil, racemose, 1- or 2- (3)-flowered; *peduncle* 1–2.5 mm long; *rachis* 0–0.5 mm long;

*subtending bracts* spreading, spatulate, somewhat hooded, ca. 0.5 mm long. *Pedicels* 2–4 mm long. *Calyx* broadly campanulate, 2.5–3 mm long including the 1–1.25 mm receptacle; teeth minute (< 0.25 mm long); upper 2 lobes ± united; lower 3 lobes flaring from the base. *Corolla: standard* broadly obovate, emarginate, cordate, 7.5–8 × 6–7 mm including the 1–1.5 mm claw, orange-yellow with a dark red centre; *wings* obliquely obovate with a rounded, incurved apex that is overlapping and enclosing the keel, auriculate, 6–8.5 × 2.75–3 mm including the 1–1.75 mm claw, black except the dark red margins; *keel* half obliquely narrowly ovate, inflexed at centre, upper half contracted to an obtuse beak, auriculate, slightly saccate, 7–7.5 × 1.75–2 mm including the 2.5–3.5 mm claw, dark red infused with black. *Stamens* moderately dimorphic: inner whorl of 5 with longer, slightly narrower filaments and shorter, versatile anthers; outer whorl of 5 with shorter, slightly broader filaments and longer, basifixed anthers; filaments all compressed; anthers all 2-celled, subdorsifixed. *Pod* obliquely very broadly to shallowly obtriangular, acuminate, swollen, 11–16 × 7–10 mm; upper suture weakly sigmoid; lower suture acute to 90°. *Seed* globular, 3 mm diam., red-brown; *aril* absent because the funicle separates cleanly from the hilum when seed is shed. (Fig. 113).

**Chromosome number:**— $n = 9$ ; voucher *G.J. Keighery 2432* (Crisp 1984).

**Common name:**—Buggery bush.

**Flowering period:**—Mainly June to August. *Fruiting period:* September to November.

**Distribution:**—Western Australia, from Kalbarri south to Perth, where it is rare, though it is common from Jurien Bay to Three Springs.

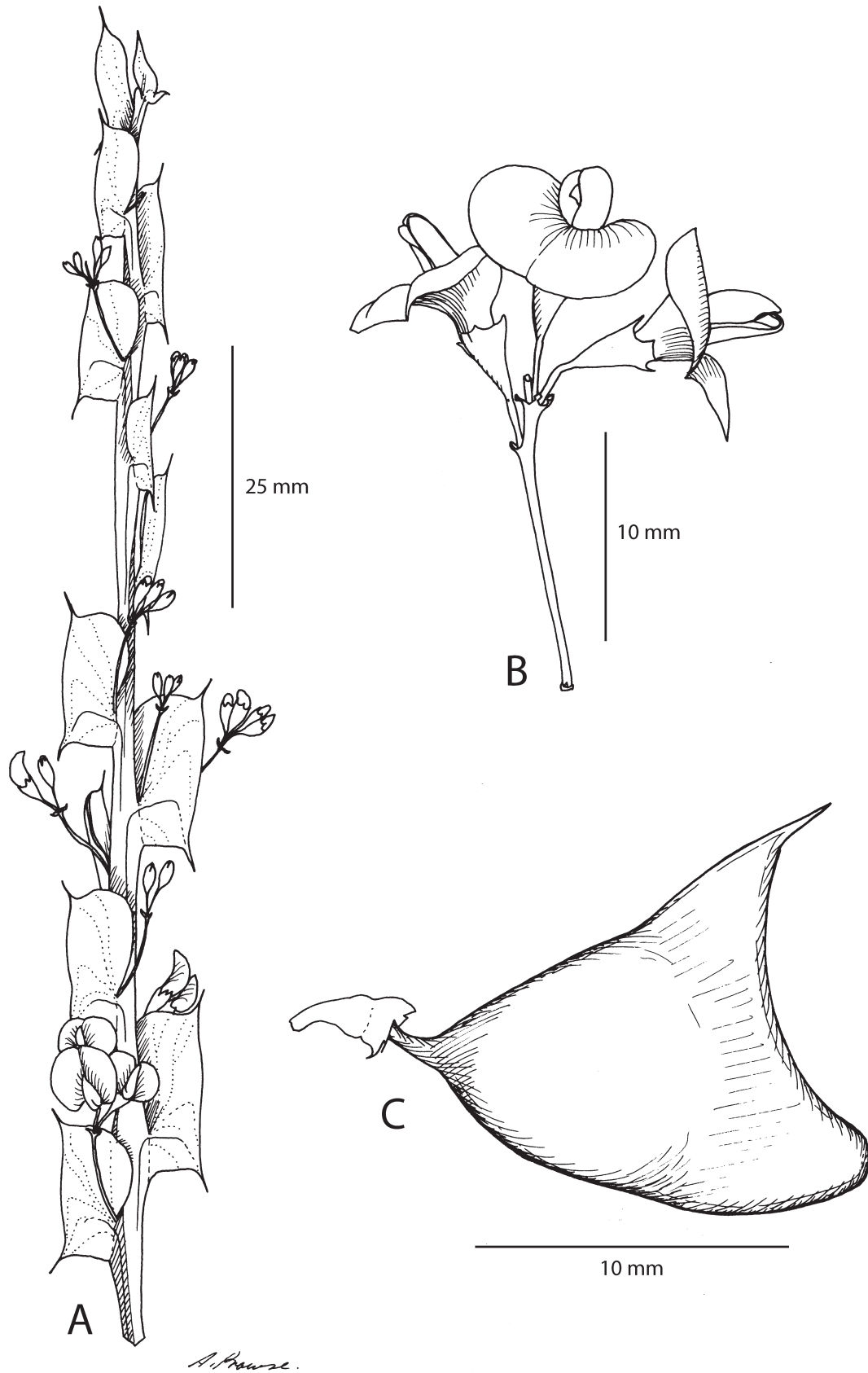
**Habitat:**—On sand with lateritic subsoil in kwongan heath dominated by shrubby taxa such as *Banksia* and *Hakea*, with scattered emergent *Eucalyptus* spp.

**Selected specimens (47 examined):**—**WESTERN AUSTRALIA. Irwin:** Three Springs, 29°32'S, 115°46'E, *B.C. Crisp 489*, 23 August 1977 (CBG, PERTH); Burma Road, SE of Walkaway, ca. 28°58'S, 114°49'E, *A.M. Ashby 2894a*, 20 July 1969 (AD, PERTH); 29 km W of Three Springs, 29°34'S, 115°28'E, *C. Chapman (25)76*, 31 July 1976 (CBG, L); just W of Brand Hwy, on Green Head Road, 30°04'S, 115°20'E, *C. Chapman s.n.*, 8 July 1979 (CBG 8302561); Irwin River, ca. 29°17'S, 115°10'E, *F.W. Went 225*, 6 September 1962 (PERTH); between Location 9849 and NE corner of Winchester Grazing Co., ca. 29°45'S, 115°55'E, *C. Chapman (118)77*, 24 October 1977 (CBG, PERTH); Old Jurien Bay Road 'A', ca. 30°18'S, 115°00'E, *S. Chambers s.n.*, 16 July 1969 (PERTH 5195489); 24 km N of Green Head Road along Eneabba South Road, 5 km ENE of Lake Indoon, 29°52'S, 115°12'E, *M.D. Crisp 5442*, 24 January 1979, seedling (CBG). **Darling:** Maida Vale, near Perth, 31°57'S, 116°01'E, *M.E. Phillips 2651*, 24 October 1962 (CBG); Perry Road, east of Yanchep, 31°33'S, 115°42'E, *J. Havel 61*, 11 August 1965 (PERTH); Gooseberry Hill, Darling Range, 31°57'S, 116°03'E, *A. Morrison s.n.*, 16 August 1906 (AD 96344252).

**Affinity:**—Given the vertical orientation and quadrilateral shape of its phyllodes, the only other species with which *D. podophylla* could be confused is *D. quadrilatera*. (The original type material of *D. quadrilatera* was a mixture of both species.) *Daviesia quadrilatera* differs in having angular branchlets that are never apically spinescent, sessile phyllodes that are adnate to the branchlet by a 1.5–4 mm broad base and especially by its unit inflorescence, which is umbelliform with a robust, 5–12 mm long rachis and 3–6 flowers on pedicels much shorter than the peduncle (pedicels 1–4 mm long, peduncle 5–14 mm). The flowers of *D. quadrilatera* are rather larger than those of *D. podophylla*, e.g. the calyx is ca. 5 mm long and the standard is ca. 9 mm broad.

**113. *Daviesia quadrilatera*** Benth. in Lindley (1839: xiv), Bentham (1864: 85, partly), Crisp (1984: 164), Crisp (1995: 1226). Type: Not designated. Lectotype (Crisp 1984: 164): Swan River, *Drummond*, 1839 (K, ex Herb. Bentham, twig marked 1a); isolectotype: twig marked 1b

Robust *shrubs* to 1.2 m high and 1 m broad, glabrous, ± glaucous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending to erect, not apically spinescent, angular with longitudinal decurrent ridges, otherwise smooth when fresh, wrinkled-striate when dry. *Phyllodes* erect, vertically flattened, obliquely quadrilateral or triangular, pungent at apex, adaxial margin strongly curved, abaxial margin with a spinescent broadly triangular lobe near base, sessile and adnate to the branchlet by a 1.5–4 mm broad articulate base, (11–)17–21 × (3–)6–13 mm (length measured to the spinescent apex), smooth when fresh, with raised anastomosing veins when dry. *Unit inflorescences* 1 (rarely 2) per axil, umbelliform, occasionally with 1–3 flowers lower down the peduncle (e.g. *Chapman (81)77* and *Gittins 1687*), 3–6-flowered; *peduncle* becoming



**FIGURE 114.** *Daviesia quadrilatera*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from Newbey 2265; B from Chapman s.n. (CBG 7908908); C from Crisp 5452. Drawn by A.L. Prowse.

broader towards the apex, 5–14 mm long; *rachis* mostly nil, but up to 5 mm when flowers present down the peduncle; *barren basal bracts* few, ascending to spreading, oblong, keeled, ca. 0.5 mm long; *subtending bracts* spreading, spatulate, ca. 0.75 mm long. *Pedicels* 1–4 mm long. *Calyx* 4–4.5 mm long including the 1–1.5 mm stipe-like receptacle; upper 2 lobes united into a narrow, truncate lip; lower 3 lobes triangular, flared from just below the base; lobes ca. 0.5 mm long. *Corolla: standard* transversely elliptic, emarginate, cordate, 7–8.5 × 7.5–9 mm including the ca. 1.5 mm claw, with or without 2 small calli at the base of the lamina, yellow, yellow-orange or orange with a red centre; *wings* elliptic with a rounded and incurved apex enclosing the keel, auriculate, ca. 7.5–8 × 3 mm including the 1.5–2 mm claw, red; *keel* half transversely ovate, beaked, auriculate, slightly saccate, ca. 8–9 × 2.5–3 mm including the 4 mm claw. *Stamens* weakly dimorphic: inner whorl of 5 with longer, slightly thinner filaments and shorter, versatile anthers; outer whorl of 5 with shorter, slightly broader filaments and longer, basifixed anthers; filaments all compressed, free; anthers all 2-celled, subdorsifixed. *Pod* obliquely very broadly obtriangular, beaked, turgid, 14–16 × 11–12 mm; upper suture slightly sigmoid; lower suture acute. *Seed* not seen. (Fig. 114).

**Common name:**—Buggery bush.

**Flowering period:**—July to September. *Fruiting period:* From August.

**Distribution:**—Western Australia, north of Perth from New Norcia to near Dongara; most records are from the Green Head–Coorow–Three Springs area.

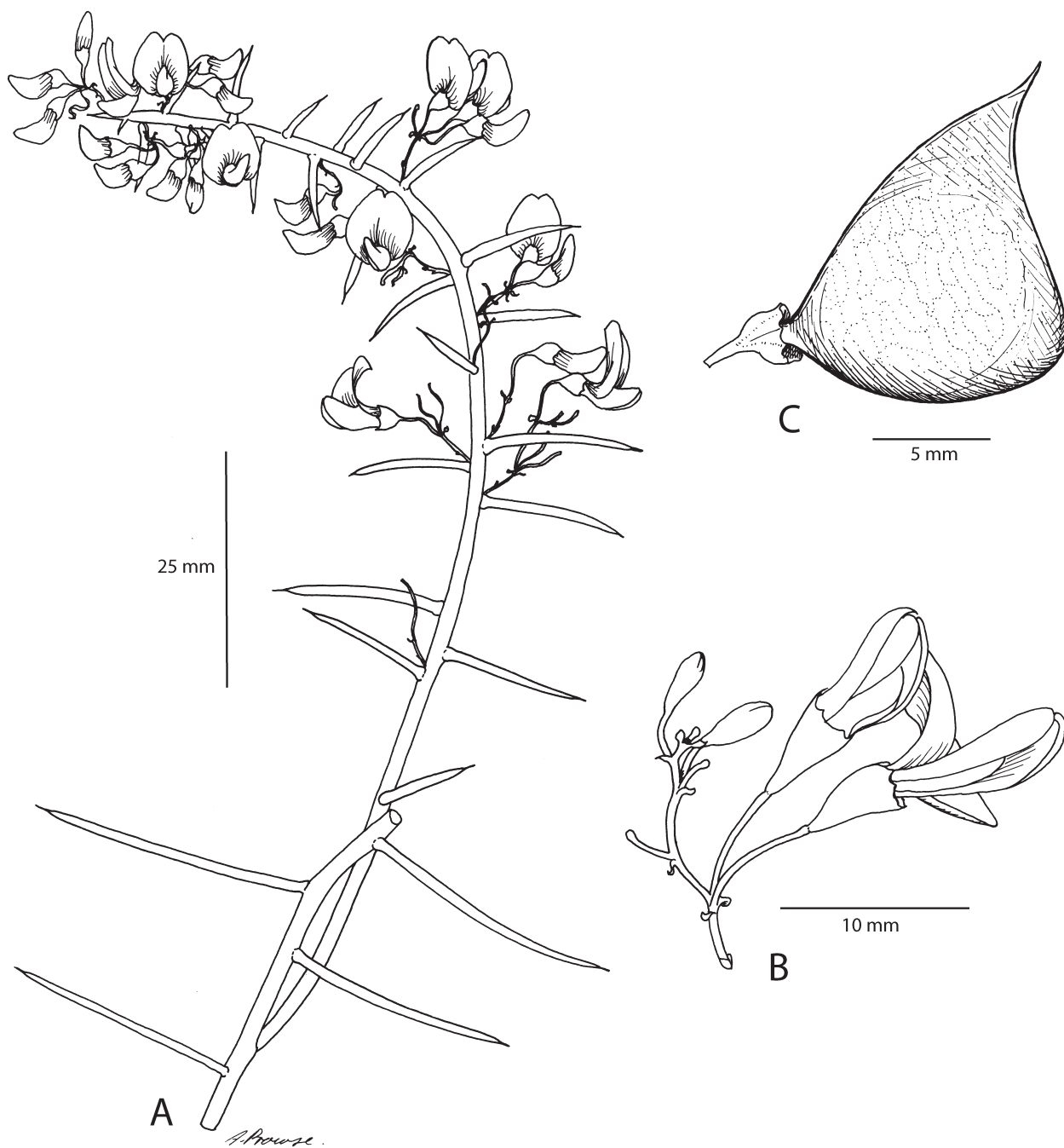
**Habitat:**—Grows in sand or gravelly soils on laterite or ironstone in kwongan heath.

**Selected specimens (14 examined):**—**WESTERN AUSTRALIA.** **Irwin:** 56 km E of Jurien Bay on road to Marchagee, 30°12'S, 115°31'E, *J.S. Beard* 7874(a), 18 September 1976 (PERTH); 45 km W of Coorow, 29°53'S, 116°01'E, *C.H. Gittins* 1687, September 1967 (BRI); 44 km from Coorow on Green Head road, 30°04'S, 115°33'E, *C. Chapman* (34)76, 3 August 1976 (CBG, MEL, PERTH); 50 km W of Coorow along Green Head Road, Alexander Morrison National Park, 30°02'S, 115°37'E, *M.D. Crisp* 5452, 24 January 1979 (CBG, PERTH); 37 km from Three Springs on Eneabba Road, 29°43'S, 115°00'E, *C. Chapman* (81)77, 18 September 1977 (CBG); 37.5 km W of Winchester on road to Eneabba, 29°48'S, 115°34'E, *C. Chapman* s.n., 22 July 1979 (CBG 7908908); 22 miles SW of Three Springs, 29°42'S, 115°30'E, *K.R. Newbey* 2265, 30 August 1965 (PERTH).

**Affinity:**—The vertical, quadrilateral phyllodes make this species very difficult to confuse with any other except *D. podophylla*, with which it shares this morphology. *Daviesia podophylla* differs in having terete branchlets that are often spinescent, phyllodes that are constricted at the base to a pseudo-petiole, and a racemose uniflorescence with 1 or 2 (3) flowers on a short (1–2.5 mm) peduncle. Also, the flowers of *D. podophylla* are smaller (e.g. the calyx is 2.5–3 mm long and the standard is 7.5–8 × 6–7 mm).

**114. *Daviesia ramosissima*** Crisp (1995: 1226). Type: Western Australia, Irwin, Kalbarri–Ajana road, 27 miles [43 km] SE of Kalbarri, *R.V. Smith* 66/369, 8 September 1966. Holotype: MEL 606416; isotypes: MEL 606417, PERTH

Much-branched, intricate *shrubs*, to 1.2 m high and broad, glabrous, glaucescent. *Root anatomy* unknown. *Branchlets* divaricate, arching, terete, smooth when fresh, wrinkled-striate when dry. *Phyllodes* scattered, divaricate, terete, needle-like, apex acicular, pungent, base articulate, 5–43 mm long, ca. 1 mm diam., smooth when fresh, wrinkled-striate when dry, rigid. *Unit inflorescences* 1 per axil, racemose, 2–8-flowered; *peduncle* striate, 1.5–4 mm long; *rachis* flexuose, striate, 2–11 mm long; *barren basal bracts* numerous, clustered around the base of the peduncle, or if peduncle > ca. 3 mm, spread along peduncle up to 0.5 mm long; *subtending bracts* recurved to spreading, oblong, ca. 0.75 mm long. *Pedicels* dilated distally, striate, 2–8 mm long. *Calyx* flared just below lobes, 4–5 mm long including the 1.25–2 mm receptacle; upper 2 lobes united into a narrow, truncate lip, ca. 0.75 mm long; lower 3 lobes triangular, ca. 0.5 mm long; occasionally lobes appearing equal. *Corolla: standard* very broadly ovate, emarginate, 11.5–12.5 × 8–11 mm including the 1–2 mm claw, with 2 small, narrow calli at the base of the lamina that are not always apparent, orange-yellow with a red central ring; *wings* obliquely obovate with a rounded, incurved apex, overlapping to clasp and enclose the keel, auriculate, 10–10.5 × 3.5–4.25 mm including the 2–2.5 mm claw, red; *keel* half very broadly ovate, apex incurved and beaked, auriculate, saccate, ca. 9 × 2.75–3 mm including the 4–4.5 mm claw. *Stamens* weakly dimorphic: inner whorl of 5 with longer, narrower filaments and shorter, subdorsifixed anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; filaments all somewhat compressed, cohering towards base; anthers all 2-celled. *Pod* obliquely very broadly to shallowly obtriangular, acuminate to acute, turgid, thick-walled, 12–15 × 9.5–12 mm, purplish grey; upper suture straight to slightly curved downwards; lower suture acute. *Seed* not seen. (Fig. 115).



**FIGURE 115.** *Daviesia ramosissima*. A. Flowering branchlet. B. Inflorescence. C. Pod. A from *George 7392*; B, C from *Crisp 6262*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**Flowering period:**—July to September. *Fruiting period:* Only specimen fruiting in September.

**Distribution:**—Western Australia, from Kalbarri National Park south to near Mingenew.

**Habitat:**—Gravelly sand over laterite on sandplains in kwongan heath.

**Additional specimens examined:**—**WESTERN AUSTRALIA.** *Irwin:* 40 km NW of Highway 1 along road to Kalbarri, 27°45'S, 114°23'E, *M.D. Crisp 6262 et al.*, 30 September 1979 (CANB, MEL, NSW, PERTH); 43 km E of Kalbarri, 27°49'S, 114°28'E, *A.S. George 7932*, 8 September 1966 (PERTH); Kalbarri National Park, 27°40'S, 114°25'E, *A. Kanis 1547*, 8 August 1973 (CANB); 39 km from Kalbarri on track to gorge, *A.R. Fairall 1238*, 5 September 1963 (PERTH); Murchison's River, *F.J.H. von Mueller s.n.*, October 1877 (MEL 81291); north of Irwin [River] on Mt [Horner West] Road, 29°13'S, 115°05'E, *A.M. Ashby 3849*, 6 July 1971 (AD, UMO, ZT); 23 km E of Dongara on Mingenew Road, 29°13'S, 115°09'E, *C.E. Woolcock D233 & D. T. Woolcock*, 20 August 1982 (CBG).

**Affinity:**—This species belongs to the *D. incrassata* group, with which it shares turgid pods, a distinctive calyx and a beaked keel. Its flowers are among the largest in that group, being exceeded only by *D. grossa* and *D. glossosema*, and equalled by *D. inflata*. The vegetative appearance of *D. grossa* is very different, with thick (> 1.5 mm), glaucous, erect phyllodes. In *D. glossosema*, which has a similar divaricating, arching growth habit, the standard is narrow, and the flowers are in pendulous umbelliform racemes and maroon in colour. In *D. inflata*, the phyllodes are more ascending (mostly at 45–60°) than in *D. ramosissima* and have recurved tips, and the branchlets are fewer and ascending rather than divaricate and recurved.

Other taxa in the *D. incrassata* group have a vegetative appearance similar to that of *D. ramosissima*. One of these, *D. incrassata* subsp. *reversifolia*, differs in having the phyllodes continuous, not articulate, with the branchlets. Another, *D. retrorsa*, has only slightly turgid pods, an acute rather than beaked keel, inner stamens with confluent anther thecae, and phyllodes often reduced to scales over much of the plant.

**115. *Daviesia apiculata*** Crisp (1995: 1170). Type: Western Australia, Eyre, 9 km SW of Israelite Bay along road to Esperance, 33°39'S, 123°46'E, *M.D. Crisp* 4891, 7 January 1979. Holotype: CBG; isotypes: K, L, MEL, NSW, PERTH

Erect, bushy, *shrubs*, 0.4–1.5 m high, glabrous, light green, glaucescent. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete, slightly flexuose, smooth when fresh, wrinkled-striate when dry. *Phyllodes* scattered, erect, rigid, terete, apiculate with a ± pungent 0.5–1 mm mucro, articulate at base, 25–60 mm long, 1.25–1.5 mm diam., smooth when fresh, striate when dry. *Unit inflorescences* 1 per axil, racemose, 4–6-flowered; mostly yellow tinged red towards the centre; *peduncle* 1–3 mm long; *rachis* 2–6 mm long; *barren basal bracts* forming on involucre, oblong, appressed, ca. 0.5 mm long; *subtending bracts* appressed to the pedicel, triangular, ca. 0.75 mm long. *Pedicels* 1–2 mm long. *Calyx* 3–3.5 mm long including the 1–1.25 mm receptacle; upper 2 lobes united in a truncate lip, ca. 0.5 mm long; lower 3 lobes triangular, ca. 0.25 mm long. *Corolla: standard* transversely elliptic, emarginate, margins reflexed, ca. 4–4.5 × 5 mm including the 1 mm claw; *wings* oblong, rounded and incurved but scarcely overlapping the keel, auriculate, ca. 4.5 × 1.5–1.75 mm including the 1 mm claw; *keel* half transversely elliptic, acute, auriculate, saccate, 4–4.5 × 1.5–2 mm including the ca. 1.5 mm claw. *Stamens* strongly dimorphic: inner whorl of 5 with longer, slender, narrower filaments and shorter, round, versatile anthers with confluent thecae; outer whorl of 5 with shorter, broader filaments and longer, oblong, basifixed, 2-celled anthers; filaments all compressed, free. *Pod* obliquely shallowly obtriangular, acute to acuminate, compressed, 14–15 × 6–8 mm; upper suture sigmoid; lower suture acute. *Seed* ellipsoid, compressed longitudinally, ca. 5 mm long, 2.5 mm broad, 1.5 mm thick, light brown to orange-brown with black mottling; *aril* ca. 2 mm long. (Fig. 116).

**Flowering period:**—November to May. *Fruiting period:* August to October.

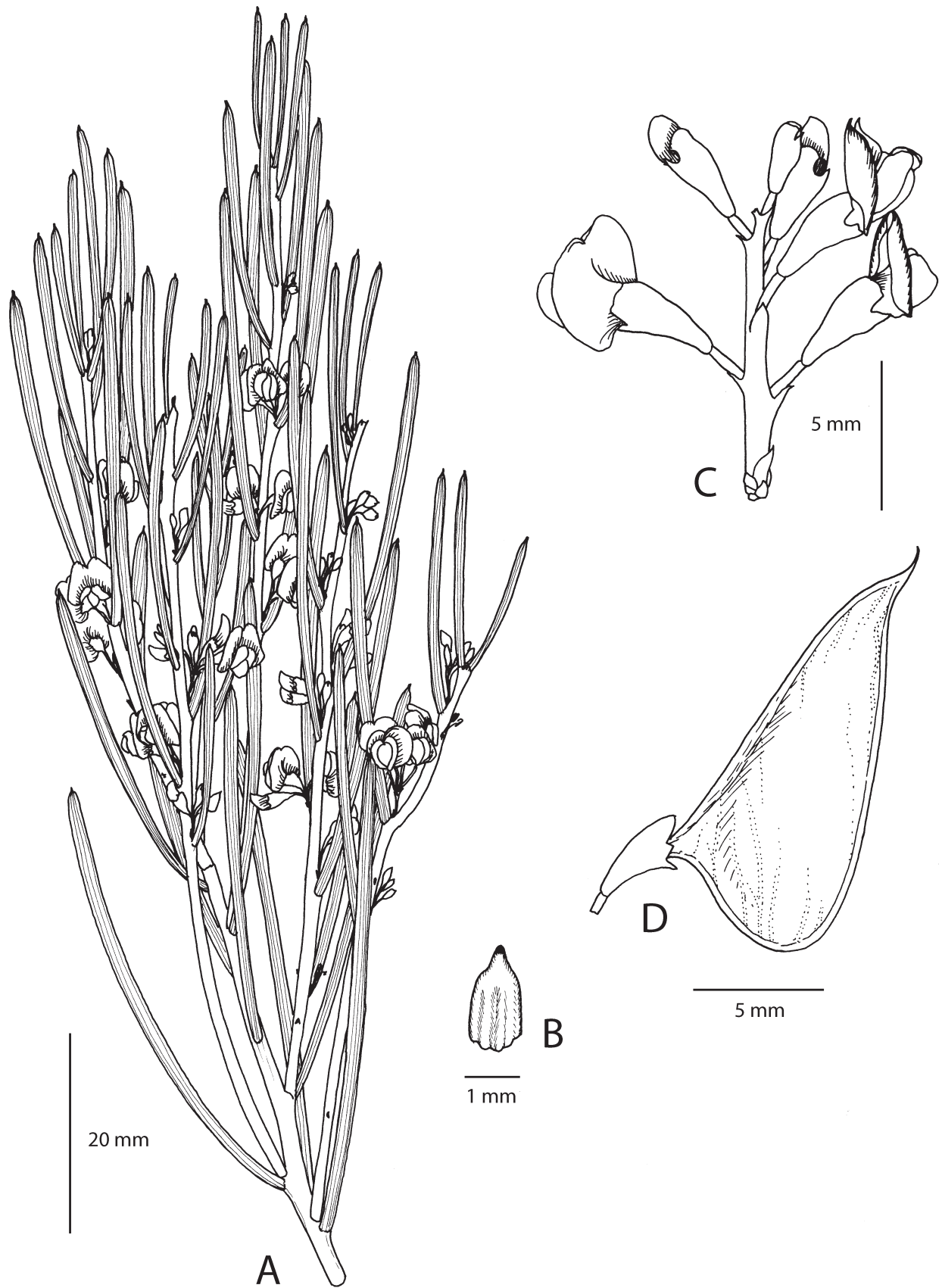
**Distribution:**—Western Australia, occurring in two apparently disjunct areas. One is in the wheatbelt and bounded roughly by Narembeen, Wickepin, Lake Grace and Hyden, and the other is east of a line from Salmon Gums to Esperance, extending to the vicinity of Israelite Bay.

**Habitat:**—Grows in light grey to white sand over laterite or gravel over sand, in kwongan shrubland dominated by *Grevillea hookeriana* Meisner (1845: 546) or by *Allocasuarina campestris*.

**Selected specimens (28 examined):**—WESTERN AUSTRALIA. **Avon:** Harrismith, 0.5 km E, 32°56'S, 117°52'E, *M.D. Crisp* 6156 *et al.*, 26 September 1979 (CBG, NSW, PERTH). **Roe:** 20 km N of Pingaring, 32°25'S, 118°40'E, *C.E. & D.T. Woolcock* D236, 11 September 1982 (CBG); 20 km NNE of Hyden, 4 km N of The Humps, 32°17'S, 118°56'E, *M.D. Crisp* 5557, 29 January 1979 (BRI, CBG, PERTH); 46 km E of Pingaring along road to Varley, 32°45'S, 118°58'E, *M.D. Crisp* 5547, 29 January 1979 (CBG, MEL, NSW, PERTH). **Eyre:** 54 km from Israelite Bay along road to Esperance, 9 km SE of Mt Baring, 33°45'S, 123°20'E, *M.D. Crisp* 4903, 7 January 1979 (CBG, PERTH); track to Howick Hill, E of Esperance, 33°44'S, 122°45'E, *J. Powell* 3438 *et al.*, 22 November 1985 (CANB, NSW); Duke of Orleans Bay, 33°55'S, 122°35'E, *R.D. Royce* 6251, 8 February 1960 (PERTH).

**Affinity:**—There are several other species of *Daviesia* with terete, erect, striate, more or less pungent phyllodes that are articulate at the stem, namely *D. grossa*, *D. lineata*, *D. oxylobium* and *D. teretifolia*. All these species differ from *D. apiculata* in having an acuminate, acicular phyllode apex, usually 2–3 mm long (1 mm long in *D. lineata*). In *D. apiculata*, the phyllode apex is scarcely pungent and certainly not acicular. Above all,





**FIGURE 116.** *Daviesia apiculata*. A. Flowering branchlet. B. Detail of phyllode tip. C. Inflorescence. D. Pod. A–C from *Crisp 4891*; D from *Crisp 6156*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

*D. apiculata* has been confused with the widespread *D. teretifolia*. The latter species, as well as *D. lineata* and *D. grossa*, differ in having larger flowers (e.g. calyx including receptacle 4 mm or longer), longer pedicels (4 mm or longer) and turgid pods. *Daviesia lineata* differs further in having 1- or 2-flowered uniflorescences and dull- or yellow-green phyllodes that are < 1 mm in diameter. *Daviesia oxylobium* differs further in having more or less equal calyx-lobes.

**116. *Daviesia teretifolia*** R.Br. ex Bentham (1864: 82), Crisp (1995: 1239). Type: 'W. Australia. King George's Sound, Baxter; Phillips Ranges and Cape Arid, Maxwell.' Lectotype (Crisp 1995: 1239): Cape Arid, Maxwell, Herb. F. Mueller (K, ex Herb. Hooker); isolectotype: MEL 80425. Syntype: K.G. Sound, N. Holland, *Baxter*: (K, same sheet as lecto); isosyntype: BM. Syntype: Phillips Ranges, Maxwell (MEL 80424); isosyntype: PERTH

Spreading *shrubs*, to 1.2 m tall, glabrous, pale green to glaucous. *Root anatomy* either with anomalous secondary thickening (cord type), or unistelar (normal but likely immature). *Branchlets* spreading to ascending, mostly terete but occasionally tetragonal, occasionally somewhat flexuose, smooth when fresh, striate when dry. *Phyllodes* crowded, steeply ascending to erect, terete, apically acicular and pungent, base slightly incurved, articulate, 17–47 mm long, 1.5–2 mm broad, smooth when fresh, longitudinally striate when dry. *Unit inflorescences* 1 per axil, racemose, (2)3- or 4-flowered; *peduncle* 2–7.5 mm long; *rachis* 2–7 mm long; *subtending bracts* spreading, oblong, ca. 0.5 mm long. *Pedicels* (3–)8–15 mm long, fimbriate at apex. *Calyx* 4.5–5.5 mm long including the 1.5–2.5 mm, often stipe-like receptacle; upper 2 lobes united into a broad, truncate lip or united higher than the lower 3 and triangular, ca. 1 mm long; lower 3 lobes triangular, ca. 1 mm long. *Corolla: standard* transversely broadly elliptic, emarginate, cordate, 7.5–8.5 × 7–9.5 mm including the ca. 1.5 mm claw, with a thick ridge on the reverse side, occasionally with 2 small calli present at the base of the lamina, yellow to orange with a dark red to black centre; *wings* obovate with a rounded, slightly incurved apex and not overlapping the keel, auriculate, 7–8 × 3–3.5 mm including the ca. 2 mm claw, dark red to maroon; *keel* half very broadly elliptic, with an inflexed beak, slightly auriculate, saccate, 7.5–8 × 1.75–2.5 mm including the 3–4 mm claw, dark red to maroon. *Stamens* moderately dimorphic: inner whorl of 5 with longer, thinner, terete filaments and slightly shorter, versatile anthers; outer whorl of 5 with shorter, broad, compressed filaments and slightly longer, basifixed anthers; anthers all 2-celled; filaments free. *Pod* obliquely shallowly obtriangular, acute, acuminate or beaked, turgid, 13–16 × 8–11.5 mm; upper suture sigmoid to upcurved; lower suture 90° to obtuse. *Seed* not seen. (Fig. 117).

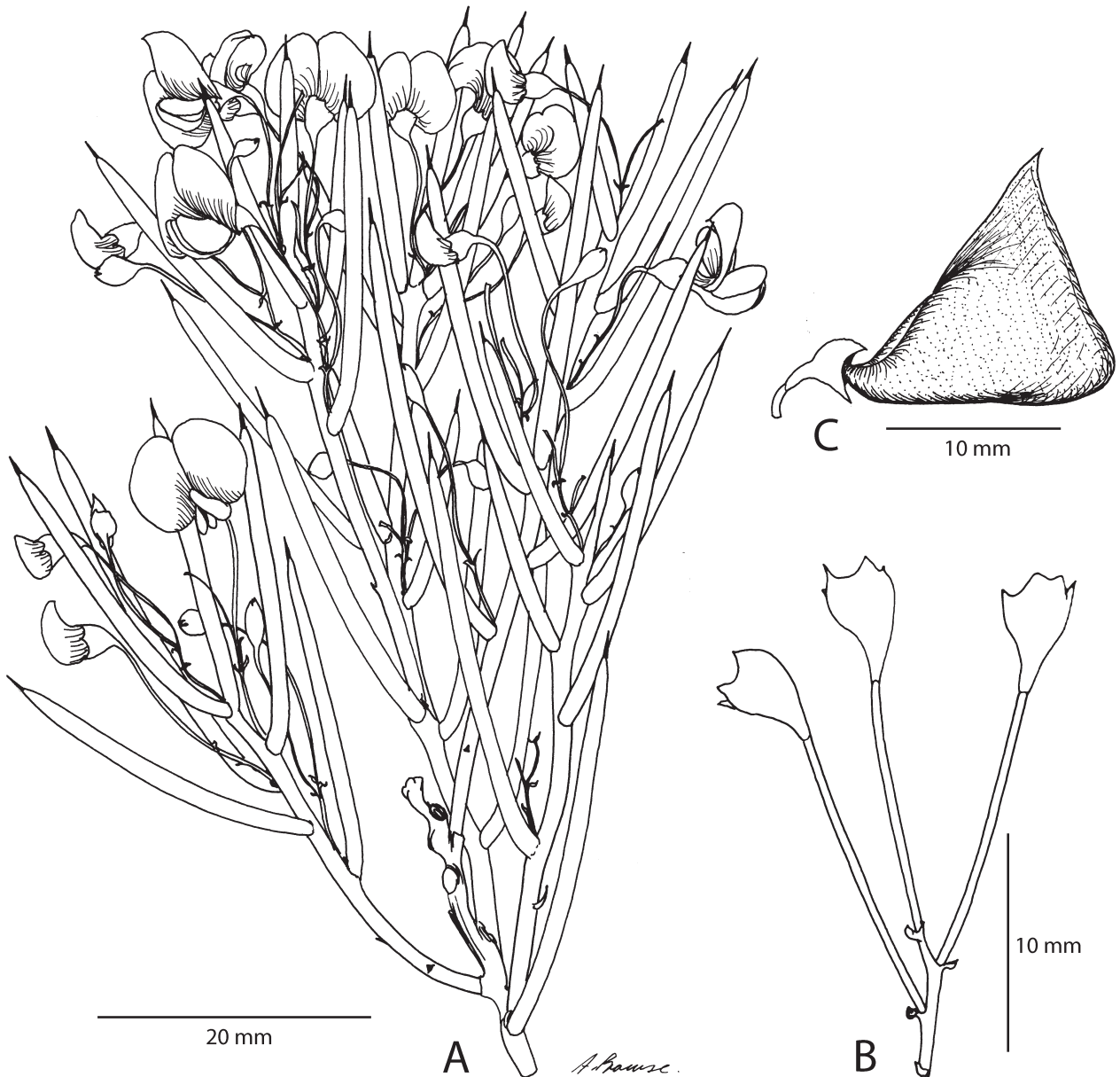
**Flowering period:**—May to October. *Fruiting period:* September to January.

**Distribution:**—Western Australia, near the south coast from Bremer Bay to Israelite Bay.

**Habitat:**—Grows in red lateritic gravel to sand on gentle midslopes of hills, sandy ridges and flat sandplains, in tall kwongan shrubland dominated by *Eucalyptus preissiana* and *Banksia*, or by *Allocasuarina*, *Banksia*, *Grevillea* and *Hakea*.

**Selected specimens (16 examined):**—WESTERN AUSTRALIA. **Roe:** Junction of Rollond Road with Cascade Road, ca. 40 km N of Munglinup, 33°20'S, 120°53'E, *J. Taylor 1676* & *P. Ollerenshaw*, 11 September 1983 (AD, CBG, MEL, PERTH); 75 km NE of Ravensthorpe, 4 km W of Dunn Swamp, 33°10'S, 120°40'E, *M.D. Crisp 6040*, 21 September 1979 (CBG, PERTH). **Eyre:** S slopes of Mt Desmond, 33°37'S, 120°09'E, *M.D. Crisp 8987* & *W. Keys*, 21 October 1996, cord roots (CBG, PERTH); 4.5 km SSW of Tower Peak (Mt Ragged), 33°29'S, 123°28'E, *M.D. Crisp 4851*, 6 January 1979 (CBG, PERTH); Cape Arid National Park, 14 km SW of Israelite Bay, 33°41'S, 123°44'E, *R. Borough 6*, 2 September 1978 (CBG, K, PERTH); 13 km N of Hopetoun, 33°51'S, 120°10'E, *E.M. Bennett 2580*, 2 September 1968 (CANB, PERTH); 62 km W of Ravensthorpe towards Ongerup, 33°46'S, 119°34'E, *P.G. Wilson 5404*, 3 October 1966 (CANB, PERTH).

**Affinity:**—This species is very similar to four other species of *Daviesia* with more or less erect, terete phyllodes: *D. grossa*, *D. apiculata*, *D. lineata* and *D. oxylobium*. *Daviesia grossa* is most similar and differs mainly in being both a larger shrub (to 3 m high) and larger in all its parts (e.g. calyx 7–8 mm long and standard 14.5–17 mm long) with the wings strongly incurved at the apex and overlapping the keel. *Daviesia teretifolia* is sympatric with *D. grossa*, growing in the heathland around the base of the Russell Range, on the slopes of which *D. grossa* is found. There is no suggestion of morphological intergradation between these species; moreover, *D. teretifolia* flowers in winter and spring, whilst *D. grossa* flowers in summer and autumn.

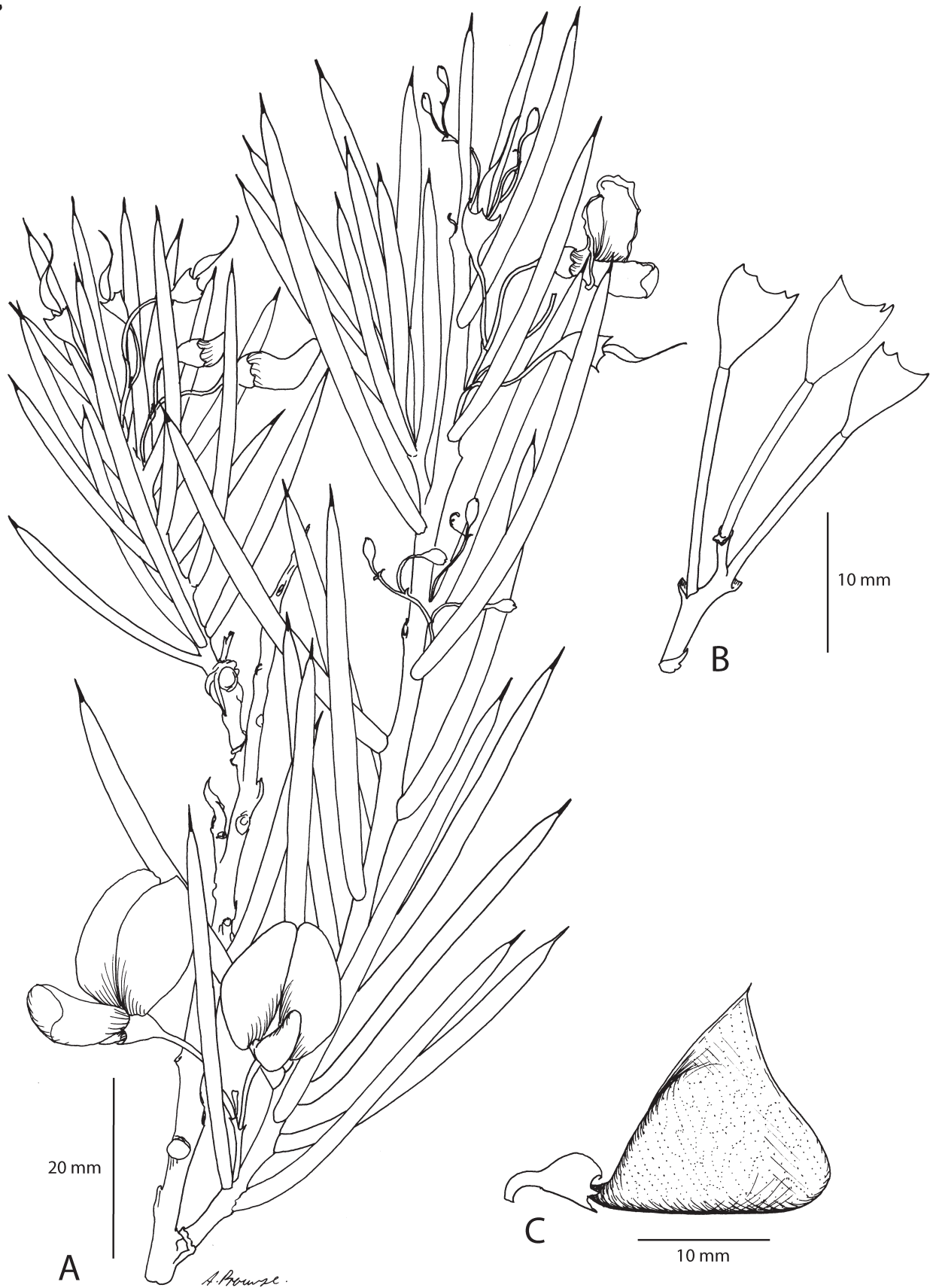


**FIGURE 117.** *Daviesia teretifolia*. A. Flowering branchlet. B. Inflorescence, flowers represented only by calyces. C. Pod. A, B from *Crisp 6040*; C from *Crisp 4851*. Drawn by A.L. Prowse.

Superficially, *D. teretifolia* resembles *D. oxylobium* very closely, mainly in the erect, clavate, pungent phyllodes; however, the phyllode striations are more sharply defined in *D. oxylobium*. Moreover, *D. oxylobium* is easily distinguished by its conspicuously longer pedicels (1–3 mm long) and larger flowers (e.g. calyx 2.5–3 mm long, standard 4–5.5 × 5.5–6 mm).

*Daviesia apiculata* has also been confused with *D. teretifolia*, but differs in having an apiculate, semi-pungent (not acicular) phyllode apex, relatively narrower wing petals (1.5–1.75 mm broad) and a compressed pod that is acute rather than beaked. Occasionally, *D. teretifolia* has united upper calyx lobes (like those of *D. apiculata*), though the upper 2 lobes are usually united higher than the lower 3 as opposed to united.

*Daviesia lineata* differs in being a larger plant (to 2.5 m high), and the phyllodes are narrower (< 1 mm diam.), distinctly apiculate, dull yellow to dull green and lack the fine striations of *D. teretifolia*; additionally, *D. lineata* has longer pedicels (4–8 mm long).



**FIGURE 118.** *Daviesia grossa*. A. Flowering branchlet. B. Inflorescence, floral parts except calyces omitted. C. Pod. A–C from *Crisp 4808* (type). Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**117. *Daviesia grossa*** Crisp (1995: 1196). Type: Western Australia, Eyre, Mt Ragged Range, 2.5 km S of Tower Peak, 33°28'S, 123°28'E, *M.D. Crisp 4808*, 6 January 1979. Holotype: CBG; isotypes: K, MEL, PERTH

Broombush-like *shrubs* to 3 m high, glabrous, glaucous to pruinose. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete, smooth when fresh, striate when dry. *Phyllodes* crowded, erect, linear-fusiform, apically acuminate, fiercely pungent, basally articulate, 25–55 mm long, 1.5–2.5 mm diam., smooth when fresh, striate when dry. *Unit inflorescences* 1 per axil, racemose, 2- or 3-flowered; *peduncle* 6–10 mm long, striate; *rachis* 1.5–10 mm long, striate; *subtending bracts* spreading, oblong, tips somewhat fimbriate, ca. 1 mm long. *Pedicels* thickening towards the apex, striate, 3–15 mm long. *Calyx* 7–8 mm long including the 2.5–3.5 mm receptacle; lobes ca. 1 mm long; upper 2 lobes united in a narrow, truncate lip; lower 3 lobes acuminate. *Corolla: standard* transversely to very broadly elliptic, emarginate, 14.5–17 × 13–20 mm including the 2–2.5 mm claw, with 2 small calli at the base of the lamina, yellow infused centrally with dark red; *wings* obliquely obovate, incurved and overlapping at apex to enclose the keel, auriculate, 14.5–17.5 × 4.5–6.75 mm including the 2.5–3 mm claw, dull red with a yellow abaxial margin; *keel* half ovate, acute, auriculate, saccate, 15–15.5 × 3.5–4.25 mm including the ca. 4.5 mm claw, dull dark red. *Stamens* weakly dimorphic: inner whorl of 5 with longer, subcompressed filaments and shorter, subdorsifixed anthers; outer whorl of 5 with shorter, compressed filaments and longer, basifixed anthers; filaments cohering towards base, free; anthers all 2-celled. *Pod* obliquely shallowly obtriangular with an acicular beak, turgid, 15–20 × 10–14 mm; upper suture straight; lower suture acute. *Seed* ellipsoid, 4.7–6.3 mm long, 3.2–3.5 mm broad, 2.3–3 mm thick, brown, with or without black mottling, sometimes creamy with black mottling; *aril* 2.3–3 mm long. (Fig. 118).

**Flowering period:**—November to April. *Fruiting period:* November to August.

**Distribution:**—Western Australia, where known only from Mt Ragged, Russell Range.

**Habitat:**—Rocky schist soils with skeletal sand on exposed rocky slopes or rock crevices in heath with *Eucalyptus tetraptera* Turczaninow (1849: 22), *Allocasuarina*, *Banksia* and *Melaleuca*.

**Additional specimens examined:**—WESTERN AUSTRALIA. **Eyre:** Mt Ragged, 33°27'S, 123°28'E, *A.S. George 2082*, 7 December 1960 (PERTH); Mt Ragged, 33°27'S, 123°28'E, *A.S. George 7425*, 19 January 1966 (PERTH); Tower Hill, Mt Ragged, 33°27'S, 123°28'E, *M.I.H. Brooker 4497*, 10 April 1974 (PERTH); Mt Ragged, Russell Range, 33°27'S, 123°28'E, *C.A. Gardner s.n.*, October 1931 (PERTH 5197031); Mt Ragged, ca. 0.25 the way up to summit, 33°27'S, 123°28'E, *M.A. Clements 2001*, 15 August 1980 (CBG); Mt Ragged range, 2.5 km S of Tower Peak, 33°28'S, 123°28'E, *M.D. Crisp 4821*, 6 January 1979 (CBG); base of Mt Ragged, ca. 150 km ENE of Esperance, Cape Arid National Park, *K. Newbey 8061*, 4 November 1980 (PERTH). **CULTIVATED.** Australian National Botanic Gardens nursery, ex. Western Australia, Eyre, Mt Ragged, *M.D. Crisp 7096*, 2 February 1983 (CBG).

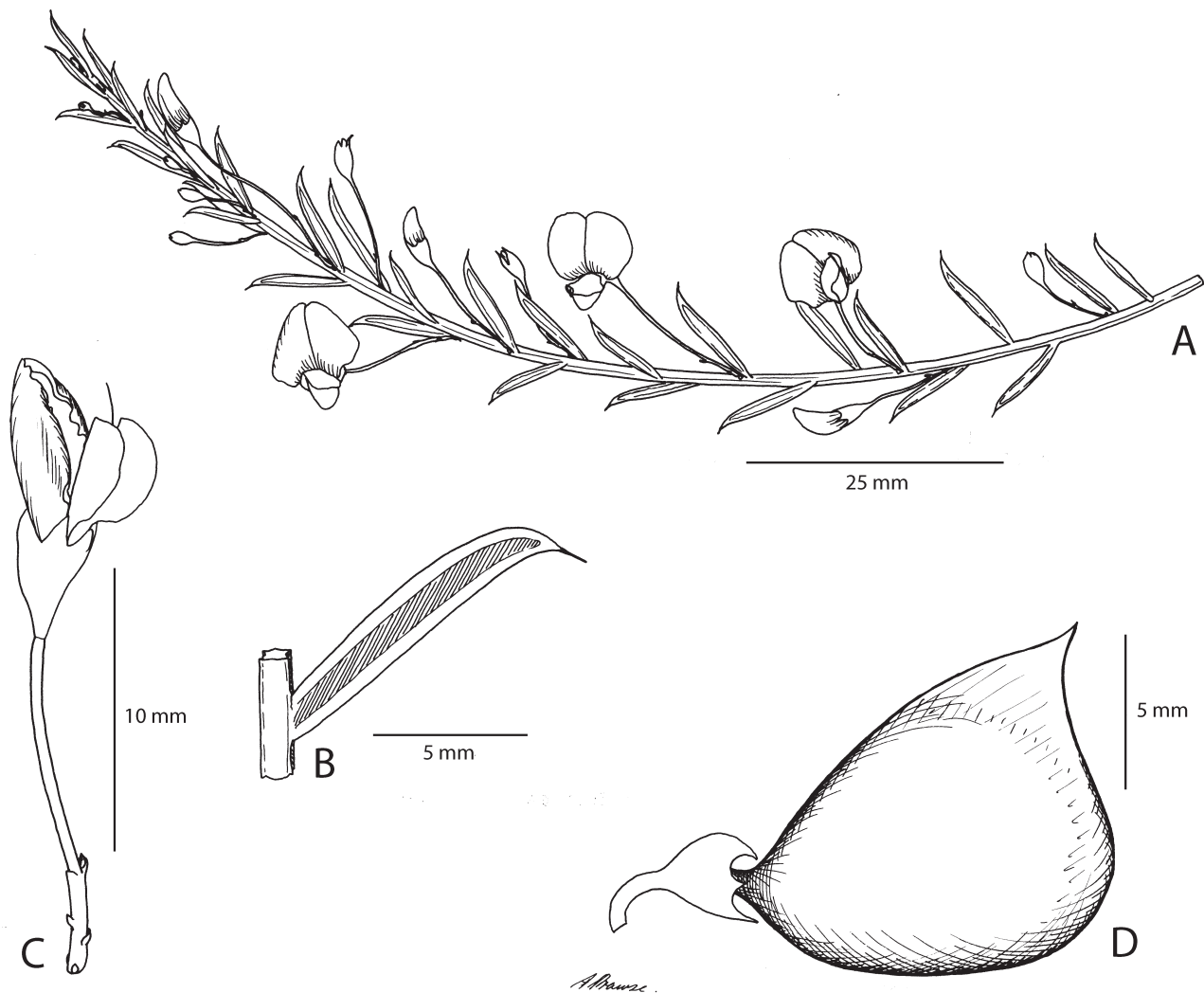
**Affinity:**—There are several other species of *Daviesia* with erect, terete, striate, more or less pungent phyllodes that are articulate at the stem, namely *D. apiculata*, *D. lineata*, *D. oxylodium* and *D. teretifolia*. *Daviesia grossa* has conspicuously larger and coarser parts than all these, in which the flowers are no more than 10 mm long, the standard is < 10 mm broad, and the phyllodes are not more than 1.5 mm diam.

The closest relative of *D. grossa* appears to be *D. teretifolia*, a widespread species along the south coast of Western Australia. The latter is very similar to *D. grossa*, differing mainly in having smaller parts; also, the wings are scarcely incurved at the apex and not overlapping. The size differences between these species are maintained in cultivation. *Daviesia teretifolia* is sympatric with *D. grossa*, growing in the heathland around the base of the Russell Range, on the slopes of which *D. grossa* is found. There is no suggestion of morphological intergradation between these species; moreover, *D. teretifolia* flowers in winter and spring, whilst *D. grossa* flowers in summer and autumn.

**118. *Daviesia mesophylla*** Ewart (1907: 38), Crisp (1995: 1211). Type: West Australia, *F. Mueller*. Lectotype (Crisp 1995: 1211): MEL 79038. Syntype: S.W. Australia, ?*F. Mueller* (MEL 79039); isosyntype or isolectotype: PERTH

Procumbent *shrubs*, to 1(–2) m across, glabrous, glossy dark green. *Root anatomy* with anomalous secondary thickening (cord roots). *Branchlets* spreading to ascending, terete, with sharp longitudinal ridges *in vivo*. *Phyllodes* irregularly spaced, divaricate to ascending, vertically compressed, narrowly obovate or linear, somewhat oblique with thickened margins and a central channel, apex acuminate, pungent, often slightly recurved, base truncate,

articulate, 7–15(–25) × 0.75–2 mm, venation obscure even when dry. *Unit inflorescences* 1(2) per axil, 1(2)-flowered; *peduncle* 0.5–5 mm long; *rachis* nil, except for the occasional terminal racemes, where it is ca. 0.5 mm long; *subtending bracts* ascending, oblong, ca. 0.5–1 mm long. *Pedicels* 4–5.5(–10) mm long. *Calyx* 4–4.5 mm long including the 1–1.5 mm receptacle; upper 2 lobes united in a narrow emarginate lip, ca. 1.5 mm long; lower 3 lobes triangular, ca. 1–1.5 mm long. *Corolla*: *standard* depressed- to very broad-ovate, emarginate, 7.5–8 × 7.5–9 mm including the ca. 1 mm claw, with 2 prominent calli at the base of the lamina, yellow to orange with a dark red centre; *wings* elliptic with a rounded apex, auriculate, 6.5–7.5 × 2–2.5 mm including the ca. 1.5 mm claw, light red; *keel* half very broadly ovate with an acicular beak, slightly auriculate, ca. 7.5 × 2 mm including the 2.5–3 mm claw, cream-coloured. *Stamens* moderately dimorphic: inner whorl of 5 with longer, ca. terete filaments and shorter, versatile anthers; outer whorl of 5 with shorter, compressed filaments and longer, basifixed anthers; filaments cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, acute, ± turgid, 12–14.5 × 8–8.5 mm; upper suture almost straight; lower suture acute to 90°. *Seed* globose, 3.5–4 mm long, 2.7–3.2 mm broad, 2.5–3 mm thick, black with a pale brown background; *aril* ca. 2.5 mm long. (Fig. 119).



**FIGURE 119.** *Daviesia mesophylla*. A. Flowering branchlet showing procumbent habit. B. Phyllode. C. Inflorescence (1-flowered). D. Pod. A–C from *Crisp* 5273; D from *Crisp* 5257. Drawn by A.L. Prowse.

**Flowering period:**—October to April. **Fruiting period:** September to January.

**Distribution:**—Stirling Range and near Denmark, Western Australia.

**Habitat:**—Gravelly sand (sometimes clayey) and rocky slopes with mallee-heath (*Eucalyptus marginata*), or in heath on wet peaty or clayey sand.

**Conservation status:**—National: Not listed. WA: Priority 2, possibly threatened or near-threatened but not yet adequately surveyed.

**Selected specimens (13 examined):**—Approximate locality data are given because the species is rare. **WESTERN AUSTRALIA. Darling:** Denmark Shire, 34°50'S, 117°10'E, *B.G. Hammersley 2158*, 20 February 1999 (CANB, DNK). **Eyre:** Stirling Range, 34°30'S, 118°10'E, *M.D. Crisp 5257*, 18 January 1979 (AD, CBG); Chester Pass, 34°20'S, 118°20'E, *A.R. Fairall 1420*, 2 April 1964 (PERTH); Stirling Range, 34°30'S, 118°10'E, *M.D. Crisp 6119, et al.*, 24 September 1979 (CBG, MEL, PERTH); Stirling Range, 34°20'S, 118°20'E, *M.D. Crisp 5273*, 18 January 1979 (AD, CBG, K, NSW, PERTH).

**Affinity:**—This distinctive species is superficially similar to *D. polyphylla* and *D. microphylla*, but may be distinguished from both by its procumbent habit and summer flowering, and from *D. microphylla* by its non-spinescent branchlets. From *D. preissii*, which also flowers in summer, it is distinguished by its sharp stem ridges and by its procumbent habit.

**Variation:**—Plants from the Denmark area have a more slender appearance with longer stems, more widely spaced, longer (to 25 mm) phyllodes, and longer peduncles and pedicels, than those in the Stirling Range.

**119. *Daviesia microphylla*** Bentham (1864: 86), Crisp (1995: 1212). Type: 'W. Australia, Swan River and Darling range, Preiss. n. 1150 and 1155; Drummond, n. 32.' Lectotype (Crisp 1995: 1212): *Drummond 32* (K, ex Herb. Hooker). Syntype: *Preiss 1150* (K, ex Herb. Bentham), MEL 79041; isosyntype: BR, FI-W, G (2 sheets), GOET, LD, MEL 79040, MO, NY, P (2 sheets), S, W (2 sheets)

*Daviesia parvifolia* Moore (1920: 168). Type: 'Kauring; G.W. Brown (Hb. Stoward, 560).' Holotype: BM.

[*Daviesia incrassata* auct. non Smith (1808b: 255); Meisner (1844: 49). Specimens cited: 'In limoso-calculosis sylvae prope Halfwayhouse (Darlings-range) 12. September 1839. Herb. Preiss. No. 1150 et in asperis montis Greenmountain (Perth) 26. April 1840. No. 1155.' Specimens seen: *Preiss 1150* (LD, NY); *Preiss 1155* (LD).]

Divaricate sprawling *shrubs*, to 0.6 m high and 1 m broad, glabrous, glossy dark green. *Root anatomy* unknown. *Branchlets* divaricate, short (ca. 1–6 cm), angular with sharp ridges *in vivo*, spinescent. *Phyllodes* crowded with bases often overlapping along the branchlets, divaricate, vertically compressed, ovate to narrowly so, often slightly oblique, apex acuminate, pungent, marginally thickened with a central depression, base cuneate to truncate, articulate, 2.5–5(–10) × 1–2 mm. *Unit inflorescences* 1 per axil, 1-flowered; *peduncle* nil; *subtending bracts* ascending, hooded, slightly keeled, with apex slightly fimbriate, ca. 0.5–1 mm long. *Pedicels* 3.5–4.5(–7) mm long. *Calyx* 2.5–3 mm including the ca. 0.75 mm receptacle; upper 2 lobes united in a truncate lip; lower 3 lobes triangular; lobes to 0.5 mm long. *Corolla: standard* round to very broadly elliptic and obovate, emarginate, 8–9 × 8–8.5 mm including the ca. 1 mm claw, with 2 small calli at the base of the lamina, orange with a dark red centre; *wings* obovate with a rounded and incurved apex, enclosing the keel, auriculate, ca. 8–8.5 × 3 mm including the 2 mm claw, maroon; *keel* half very broadly ovate with an acicular beak, slightly saccate, ca. 8–8.5 × 2 mm including the 4 mm claw, maroon. *Stamens* moderately dimorphic: inner whorl of 5 with longer filaments and shorter, versatile anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; filaments all compressed, cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, acuminate, turgid, 11–14 × 6.5–7.5 mm; upper suture straight to slightly upcurved; lower suture 90° to obtuse. *Seed* not seen. (Fig. 120).

**Flowering period:**—June to August. *Fruiting period:* Only specimen fruiting in November.

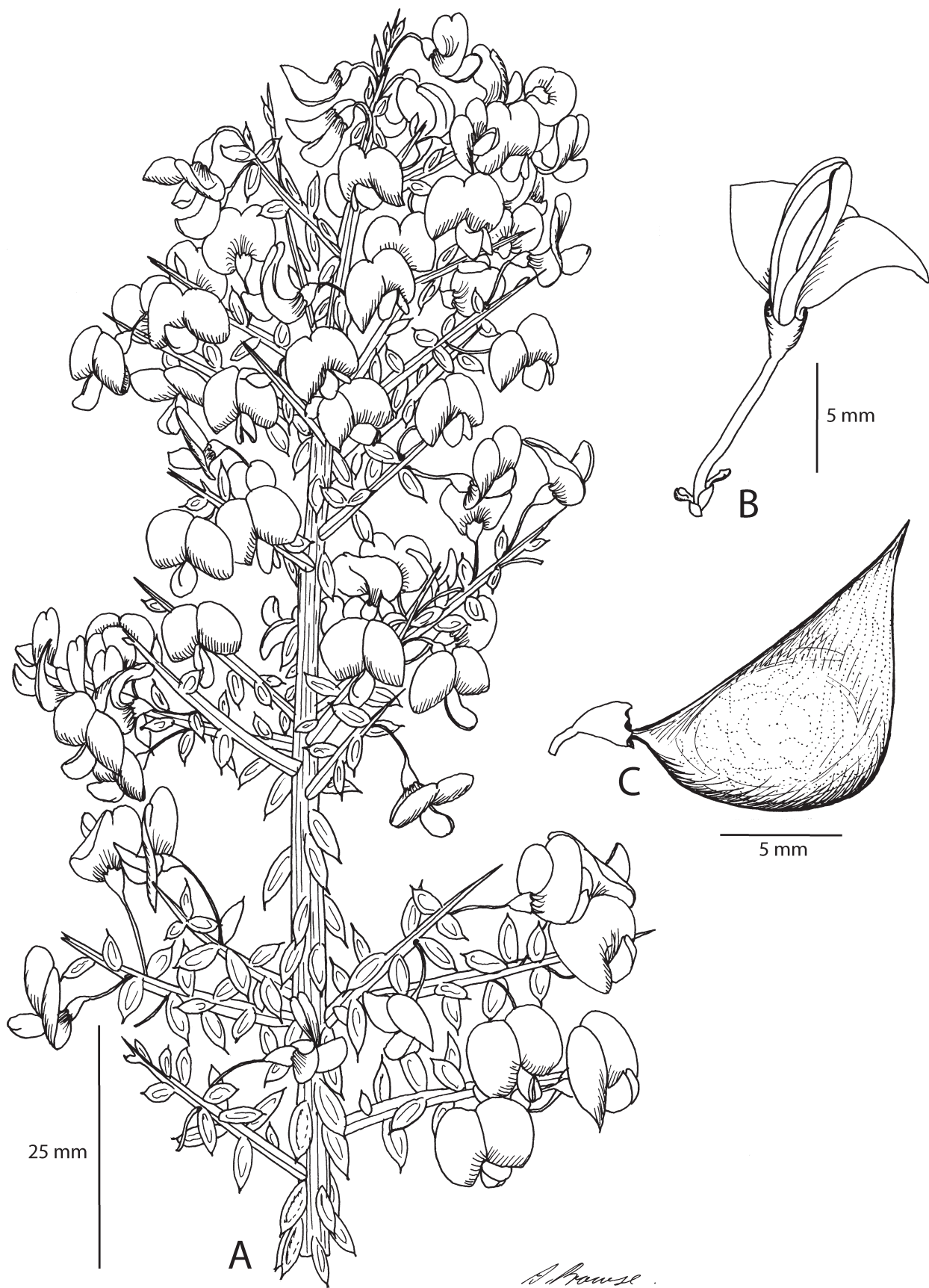
**Distribution:**—Western Australia, extant only in the eastern Darling Range and adjacent wheatbelt as far east as Dowerin–Quairading, but recorded in the past from much farther east at Brontie Station, near Koolyanobbing.

**Habitat:**—Grows on grey sandy loam with gravel or white sand in woodland dominated by *Eucalyptus wandoo* or in low heath.

**Selected specimens (12 examined):**—**WESTERN AUSTRALIA. Avon:** 1 km W of Hindmarsh Rifle Range, 31°19'S, 117°11'E, *B.H. Smith 361*, 2 June 1984 (CBG, MEL); York, 31°53'S, 116°46'E, *C.A. Gardner s.n.*, November 1920 (PERTH 5212030). **Darling:** ca. 37 km W of Beverley, Qualen Road, 5 km SW of intersection with Gunapin Ridge Road, 32°07'S, 116°32'E, *M.D. Crisp 6721*, 26 July 1980 (CBG, K, NSW, PERTH). **Coolgardie:** Brontie[e Station], 30°56'S, 119°30'E, *E. Salisbury s.n.*, 7 August 1949 (PERTH 5148472).

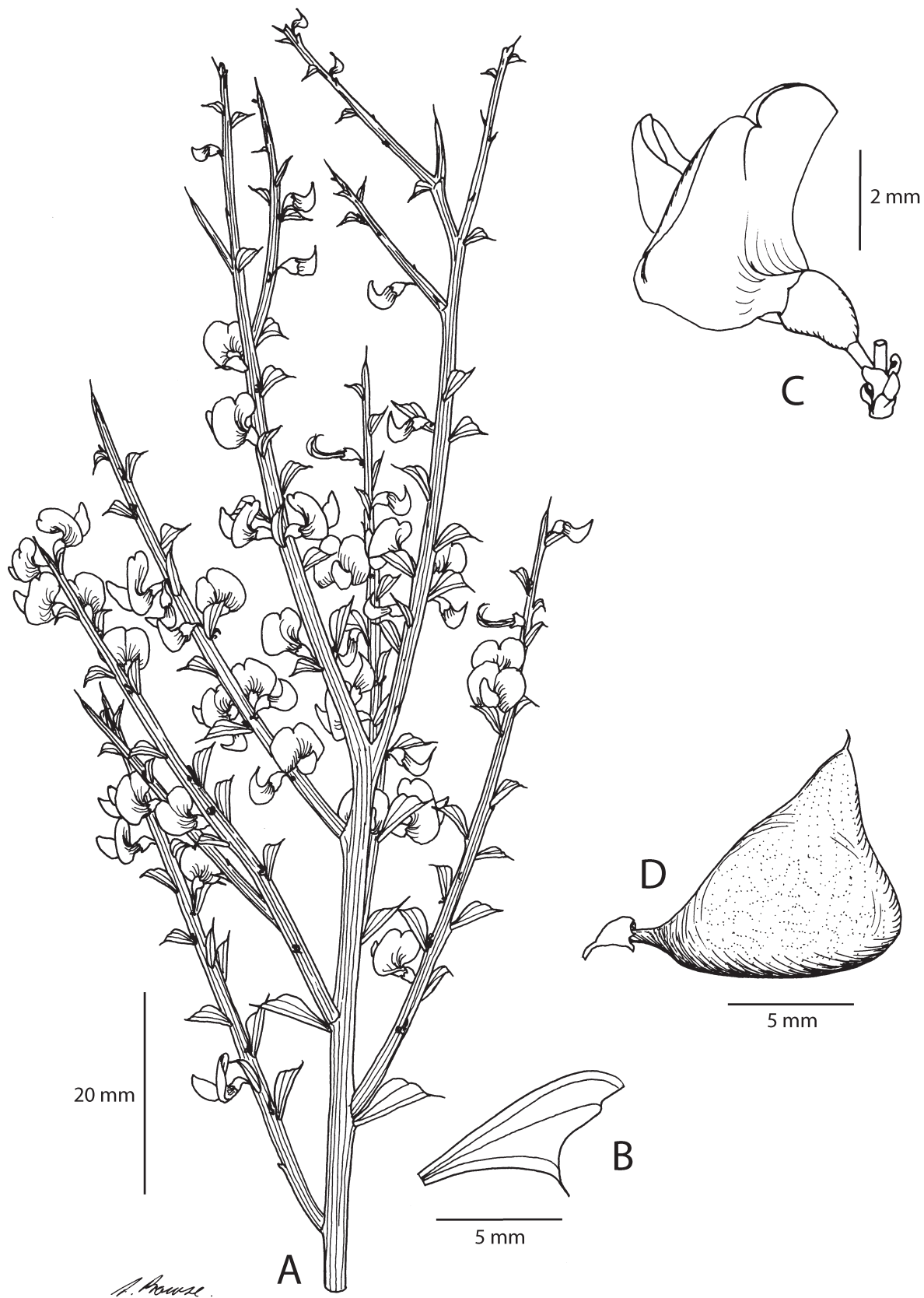
**Affinity:**—*Daviesia microphylla* is similar to *D. chapmanii* and *D. mesophylla*. *Daviesia chapmanii* can be distinguished by its non-spinescent branchlets, longer phyllodes (10–15 mm long) and paler flowers (yellow to whitish). *Daviesia mesophylla* may be distinguished from *D. microphylla* by its procumbent habit, summer flowering period and non-spinescent branchlets.

**Hybrids:**—*D. brachyphylla* × *D. microphylla* (Crisp 6725).



**FIGURE 120.** *Daviesia microphylla*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A, B from *Crisp* 6271; C from *Gardner s.n.* (PERTH 5212030). Drawn by A.L. Prowse.





**FIGURE 121.** *Daviesia oxyclada*. A. Flowering branchlet. B. Phyllode. C. Inflorescence. D. Pod. A from Chapman (11)77; B from Chapman (14)77; C from Crisp 6478; D from Chapman (77)77. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

**120. *Daviesia oxyclada*** Crisp (1995: 1217). Type: Western Australia, Irwin, 43 km W of Winchester, 29°49'S, 115°33'E, *C. Chapman* (5)76, 23 May 1976. Holotype: CBG; isotypes: K, MEL, PERTH

Divaricate *shrubs* ca. 0.6 m high, glabrous, dark green to pruinose. *Root anatomy* unknown. *Branchlets* diverging at ca. 45°, terete, smooth when fresh, ribbed when dry, spinescent. *Phyllodes* scattered, diverging at ca. 45°, obliquely obtriangular (occasionally reduced to scales), vertically compressed, with the adaxial margin dilated into an obtuse lobe, contracted at the apex into a deflexed pungent point, base articulate and easily detached, (2–)5–10(–18) × 1–4(–8) mm, with 2 or more irregular raised longitudinal nerves (prominent when dry); upper phyllodes (or rarely all, *Borger* CH 267-1 3) usually recurved and unlobed but merely asymmetric. *Unit inflorescences* 1 per axil, racemose, 1- or 2-flowered; *peduncle* ± nil; *subtending bracts* appressed to the pedicel, oblong, ca. 1 mm long. *Pedicels* 0.5–2 mm long. *Calyx* 1.5–2 mm long including the ca. 0.5 mm receptacle; lobes little more than apiculate teeth, upper 2 ± united; receptacle abruptly contracted to pedicel. *Corolla: standard* very broadly obovate, emarginate, 6.5–8 × 6–8 mm including the ca. 1 mm claw, with 2 calli at the base of the lamina, yellow, orange-yellow or deep orange surrounding a dark red centre; *wings* narrowly obovate, falcate, incurved and overlapping to enclose keel at apex, with uncinat auricles, 6–7.5 × 2–2.5 mm including the ca. 1.5 mm claw, red; *keel* half very broadly elliptic, bluntly beaked, sharply incurved through 90°, 6.5–7 × 1.5–2 mm including the 2.5–3.5 mm claw, red. *Stamens* weakly dimorphic: inner whorl of 5 with longer filaments and shorter, versatile anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; filaments all compressed, firmly cohering into a tube except upper quarter, very broad towards base; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, turgid, sharply beaked, distally indented, 9–12 × 7–8 mm, purplish pruinose; upper suture undulating; lower suture acute. *Seed* not seen. (Fig. 121).

**Flowering period:**—May to August. **Fruiting period:** August and September.

**Distribution:**—Western Australia, north of Perth from Moora through Eneabba–Carnamah to Mingenew.

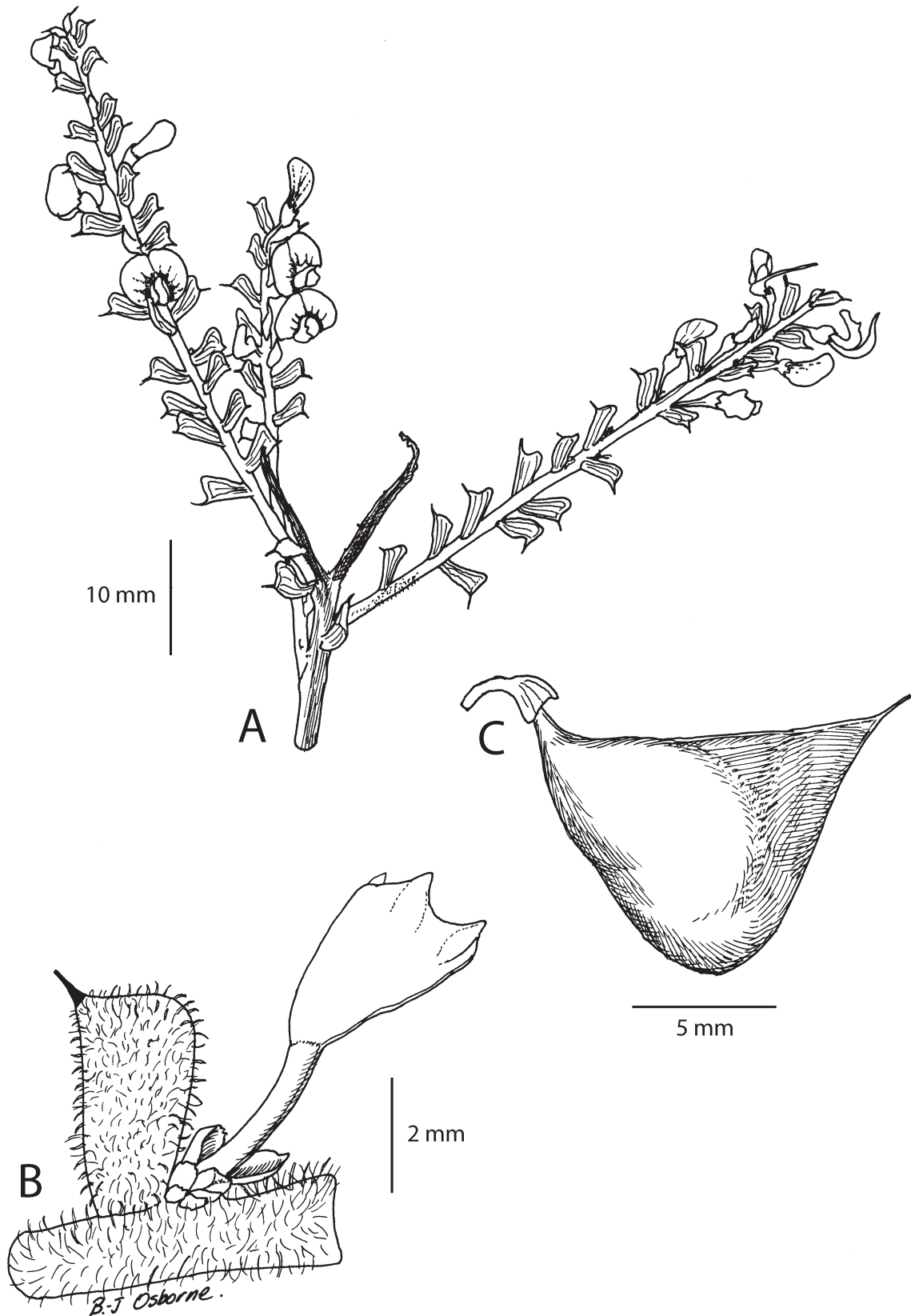
**Habitat:**—Grows in sandy, gravelly (often clayey) soils or occasionally in sandy loam, in heath (kwongan).

**Selected specimens (27 examined):**—WESTERN AUSTRALIA. **Irwin:** 2 km SW of Eneabba, near railway crossing, 29°50'S, 115°15'E, *C. Chapman* (3)78, 9 July 1978 (CBG, PERTH); 20.5 km from Three Springs on Eneabba road, 29°35'S, 115°35'E, *C. Chapman* (11)77, 19 June 1977 (CBG); creek to Jennings' settling pond, near Eneabba, 29°50'S, 115°15'E, *C. Chapman* (14)77, 19 June 1977 (CBG, NSW); 22 km N of Badgingarra, *A.S. George* 6743, 13 August 1965 (PERTH); 17 km W of Winchester along road to Eneabba, 29°48'S, 115°46'E, *M.D. Crisp* 6478, 15 July 1980 (CBG); Eneabba, 29°49'S, 115°16'E, *C.E. Woolcock* D19, 19 July 1981 (CBG); 22 km W of Winchester, 29°48'S, 115°42'E, *C. Chapman* (10)78, 29 July 1978 (CBG, PERTH); 8.5 km W of Road 36 (Willis Road) on Winchester–Eneabba Road, *C. Chapman* (77)77, 18 September 1977 (CBG); S side of Arrowsmith River, 29°28'S, 115°30'E, *J. Borger* CH 267-13, 26 July 2005 (PERTH).

**Affinity:**—This species belongs to a natural group typified by *D. incrassata*, with which it shares turgid pods, a distinctive calyx, an incurved beaked keel and weakly dimorphic stamens (see under *D. chapmanii*). Within the *D. incrassata* group, it appears most similar to *D. dielsii* and *D. physodes* with respect to phyllode morphology. The most diagnostic feature of *D. dielsii* is the short, curved hairs covering the branchlets (sometimes sparsely) and frequently the phyllodes, too; additional distinctions from *D. oxyclada* are the often non-spinescent branchlets and the smaller phyllodes: 2–4(5) mm long, 1–3 mm broad. Otherwise, these species are very similar and easily confused. *Daviesia physodes* differs in having non-spinescent branchlets, larger phyllodes (10–55 mm long), 2–4-flowered racemes and larger flowers (e.g. standard 7–8 mm broad).

**121. *Daviesia dielsii*** E.Pritz. in Diels & E. Pritzel (1904: 249), Crisp (1995: 1187). Type: 'Hab. in distr. Avon pr. Moora in fruticetis arenosis apertis flor. m. Jun. (D. 3094)' (B†). The type is missing, presumably destroyed in the Berlin herbarium during the Second World War (Hiepko 1987). Neotype (Crisp 1995: 1187): Western Australia, Darling, N of Moora, *C. Chapman* (8)77, 1 June 1977 (CBG); isoneotype: K, PERTH

Intricate *shrubs*, to 1 m high and 1.5 m broad, retrorsely hirsute to minutely so (or glabrescent), occasionally glaucous. *Root anatomy* unknown. *Branchlets* diverging at 45–90°, terete, obscurely ribbed (ribs somewhat sharp), occasionally subspinescent. *Phyllodes* rather crowded, diverging at ca. 45°, vertically compressed, obliquely obovate to broadly so, or subulate, adaxial margin ± dilated distally, apex somewhat deflexed, acuminate, pungent, base truncate, articulate, 2–4(–7) × 1–2.5(–5) mm, minutely scabrous or tomentose, glabrescent, thick and robust;



**FIGURE 122.** *Daviesia dielsii*. A. Flowering branchlet. B. Phyllode with axillary 1-flowered inflorescence (floral parts except calyx removed). C. Pod. A from Chapman (33)77; B from Chapman s.n., Marchagee, 31 May 1979; C from Chapman (92)77. Drawn by B.-J. Osborne.

venation longitudinal, raised, prominent when dry. *Unit inflorescences* solitary in the axils, 1-flowered; *peduncle* nil; *subtending bracts* clustered at the base of the pedicel, ascending to spreading, oblong, tips fimbriate, ca. 0.5–1 mm long. *Pedicel* gently thickening towards the apex, 1.5–5 mm long. *Calyx* 2–2.75 mm long including the 0.5–0.75 mm receptacle; upper 2 lobes united into a truncate lip, < 0.5 mm long; lower 3 lobes triangular, ca. 0.5 mm long. *Corolla: standard* transversely elliptic to obovate, emarginate, 5.5–7 × 5.5–7 mm including the 1–1.25 mm claw, with 2 calli at the base of the lamina (sometimes obscure), yellow with a dark red centre; *wings* elliptic with a rounded apex, auriculate (with auricles occasionally hooked), 6–7 × 2–2.25 mm including the 1.5–2 mm claw, maroon; *keel* half broadly ovate with an acicular beak, saccate, 6.5–7.5 × 1.5–1.75 mm including the 3–3.5 mm claw, red. *Stamens* slightly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, rounder anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, slender anthers; filaments cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular with an acute apex, turgid, 11–13 × 7–9 mm; upper suture slightly sigmoid to curved upwards; lower suture acute. *Seed* not seen. (Fig. 122).

**Flowering period:**—March to August. *Fruiting period:* October and November.

**Distribution:**—Western Australia, restricted to the Dalwallinu–Moora–Three Springs area, north of Perth.

**Habitat:**—Gravelly, sandy loam over clay, clayey sand or gravelly laterite along disturbed roadsides in kwongan heath with *Callitris* or *Allocasuarina*.

**Conservation status:**—National: Endangered. WA: Endangered, Declared Rare Flora.

**Selected specimens (18 examined):**—Approximate locality data are given because the species is rare.

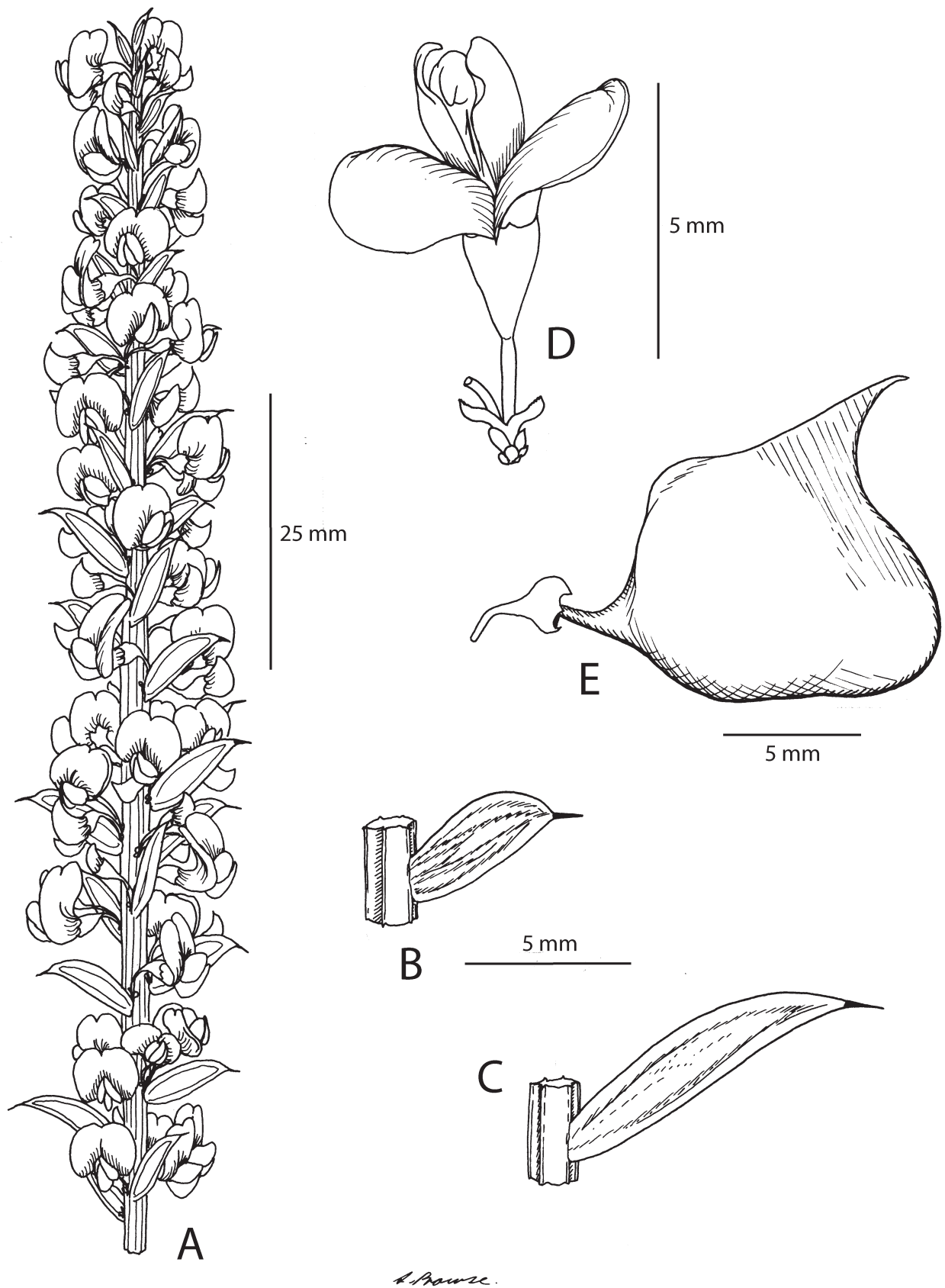
**WESTERN AUSTRALIA: Irwin:** Near Marchagee, 30°S, 116°E, *C. Chapman* (7)77, 29 May 1977 (CBG); *ibid.*, *C. Chapman* (33)77, 22 July 1977 (CBG, PERTH); *ibid.*, *M.D. Crisp* 5471, 25 January 1979 (CBG, PERTH); E of Watheroo, 30°20'S, 116°20'E, *M.D. Crisp* 6498, 16 July 1980 (AD, CBG, PERTH). **Darling:** N of Moora, 30°30'S, 116°E, *D.J.E. Whibley* 4886, 2 November 1974 (AD, PERTH); *ibid.*, *M.D. Tindale* 2654, August 1973 (NSW, PERTH); S of Koojan, 30°50'S, 116°E, *C. Chapman* (92)77, 4 October 1977 (CBG).

**Affinity:**—*Daviesia dielsii* is similar to *D. angulata*, *D. oxyclada* and *D. preissii*. *Daviesia angulata* is glabrous and has sharp, angular ridges on the branchlets, whereas *D. dielsii* is merely ribbed. *Daviesia preissii* has a thickened articulation at the base of the phyllodes, whereas *D. dielsii* lacks a thickening at the articulation. The phyllodes of *D. angulata*, *D. oxyclada* and *D. preissii* are larger: those of *D. angulata* are 10–35(–40) mm long, those of *D. oxyclada* are 2–18 mm long and those of *D. preissii* are 10–40 mm long. *Daviesia angulata* has racemose, 2–4-flowered inflorescences and *D. preissii* has umbellate, 1- or 2-flowered inflorescences, where *D. dielsii* has a 1-flowered inflorescence lacking a peduncle. Both *D. angulata* and *D. preissii* have the upper 2 calyx lobes united higher than the lower 3 but not united into a truncate lip. *Daviesia oxyclada* also differs in being entirely glabrous, has mostly spinescent branchlets, and the outer part of the standard is orange or orange-red.

**Variation:**—*Daviesia dielsii* varies in the degree of hairiness. In the south, near Moora, the branchlets are less densely hairy and the phyllodes glabrescent.

**122. *Daviesia polyphylla*** Benth. in Lindley (1839: xiv), Bentham (1864: 86), Crisp (1987a: 252), Crisp (1995: 1222). Type: Not designated. Lectotype (Crisp 1995: 1222): Swan River, *Drummond*, 1839 (K, ex Herb. Bentham); isolectotype: BM (2 sheets), CGE, G, K

Bushy, spreading *shrubs*, to ca. 0.6 × 1 m, glabrous or minutely scabrous, especially on branchlet ridges. *Root anatomy* unknown. *Branchlets* ascending, numerous, angular with sharp ridges. *Phyllodes* rather crowded, diverging at 45–90°, vertically compressed, gently recurved from the base, obliquely narrowly ovate or elliptic, apically acuminate, pungent, with thickened margins, basally truncate, articulate, 5–20 × 1.5–2.5 mm, with 2 or 3 longitudinal nerves more evident when dry, dark green. *Unit inflorescences* 1 or more per axil, umbellate, 1- or 2-flowered; *peduncle* from almost nil to 0.5 mm long; *rachis* nil; *barren basal bracts* oblong, ca. 0.5 mm long. *Pedicels* 1–2.5 mm long; *subtending bracts* oblong to slightly spatulate, may be fimbriate to lacerated at the apex, ca. 0.5–1 mm long. *Calyx* 2–2.5 mm long including the 0.5–1 mm receptacle, with 5 faint ribs visible; lobes ca. 0.5 mm long; upper 2 lobes united higher and closer together than the lower 3; lower 3 lobes marginally longer. *Corolla: standard* transverse-elliptic to transverse-broad-elliptic, emarginate to rounded, 4.5–6 × 5–6 mm including the 0.5–1 mm claw, with 2 calli at the base of the lamina, yellow-orange with pink infusion marginally and a dark red centre; *wings* elliptic with a rounded, incurved apex, enclosing the keel, auriculate, auricles may be slightly hooked, 5–6.5 × 2 mm including the 1–2 mm claw, deep pink; *keel* half very broadly ovate with an acute,



**FIGURE 123.** *Daviesia polyphylla*. A. Flowering branchlet. B, C. Phyllodes showing variation. D. Inflorescence. E. Pod. A, C, D from *Crisp 6711*; B from *Crisp 1061*; E from *Crisp 1047*. Drawn by A.L. Prowse.

beaked apex, very slightly auriculate to not so, saccate, 5–6 × 1–1.5 mm including the 2–3 mm claw, deep pink. *Stamens* slightly dimorphic: inner whorl of 5 with longer filaments and shorter, versatile anthers; outer whorl of 5 with shorter filaments and longer, basifixed anthers; filaments all compressed, cohering; anthers all 2-celled. *Pod* obliquely very broadly, shallowly or very shallowly obtriangular, acute, pungent, swollen, 9–13 × 8–10 mm; upper suture strongly sigmoid; lower suture at 90°. *Seed* obovoid, with a slightly developed radicular lobe, 3.5–4 mm long, 2.2–2.5 mm broad, 1.7–2 mm thick, green to brown with black mottling; *aril* 1.6 mm long. (Fig. 123).

**Flowering period:**—July to September. *Fruiting period:* September and October.

**Distribution:**—Western Australia, mainly coast and Darling Range from Green Head south to near Busselton.

**Habitat:**—Grows on laterite or gravelly sand, in heath dominated by Proteaceae, or with scattered emergent eucalypts such as *Corymbia calophylla* or *Eucalyptus wandoo*.

**Selected specimens (48 examined):**—**WESTERN AUSTRALIA. Darling:** 8 km N of Mogumber, on Perth–Moora road, 30°58'S, 116°02'E, *M.D. Crisp 1061*, 14 August 1975 (CBG, MEL, PERTH); 9.3 km N of Mogumber, 30°58'S, 116°03'E, *C. Chapman (22)78*, 8 November 1978 (CBG, PERTH); Darling Range scarp, near Wattle Grove (Perth), just S of Welshpool Road, 32°01'S, 116°02'E, *M.D. Crisp 1047* (CBG); 18 km E of Perth, Gooseberry Hill National Park, 31°57'S, 116°02'E, *M.D. Crisp 6711*, 24 July 1980 (AD, CBG, L, NSW, US); Greenmount, Darling Range, 31°54'S, 116°03'E, *A. Morrison s.n.*, 12 December 1902 (CANB 336560, PERTH); 2.8 km S of 'Merrie Lea' and N of Mogumber, Helena Valley, 31°02'S, 116°03'E, *J. Seabrook 23*, 30 July 1977 (PERTH); Kalamunda, 19 km E of Perth, 31°58'S, 116°03'E, *R. Hamilton 148 & M. Hamilton*, 13 August 1985 (CANB, MEL).

**Affinity:**—Similar vegetatively to *D. angulata*. The phyllodes of *D. angulata* tend to be linear, and when sigmoid are not dilated towards the apex, and are often longer (up to 35 mm long). The inflorescence of *D. angulata*, if 2–4-flowered, has a peduncle 2–6 mm long and a rachis 1–3.5 mm long, where that of *D. polyphylla* is more or less sessile with no rachis. The two species also have a different flowering period: *D. angulata* flowers from March to July.

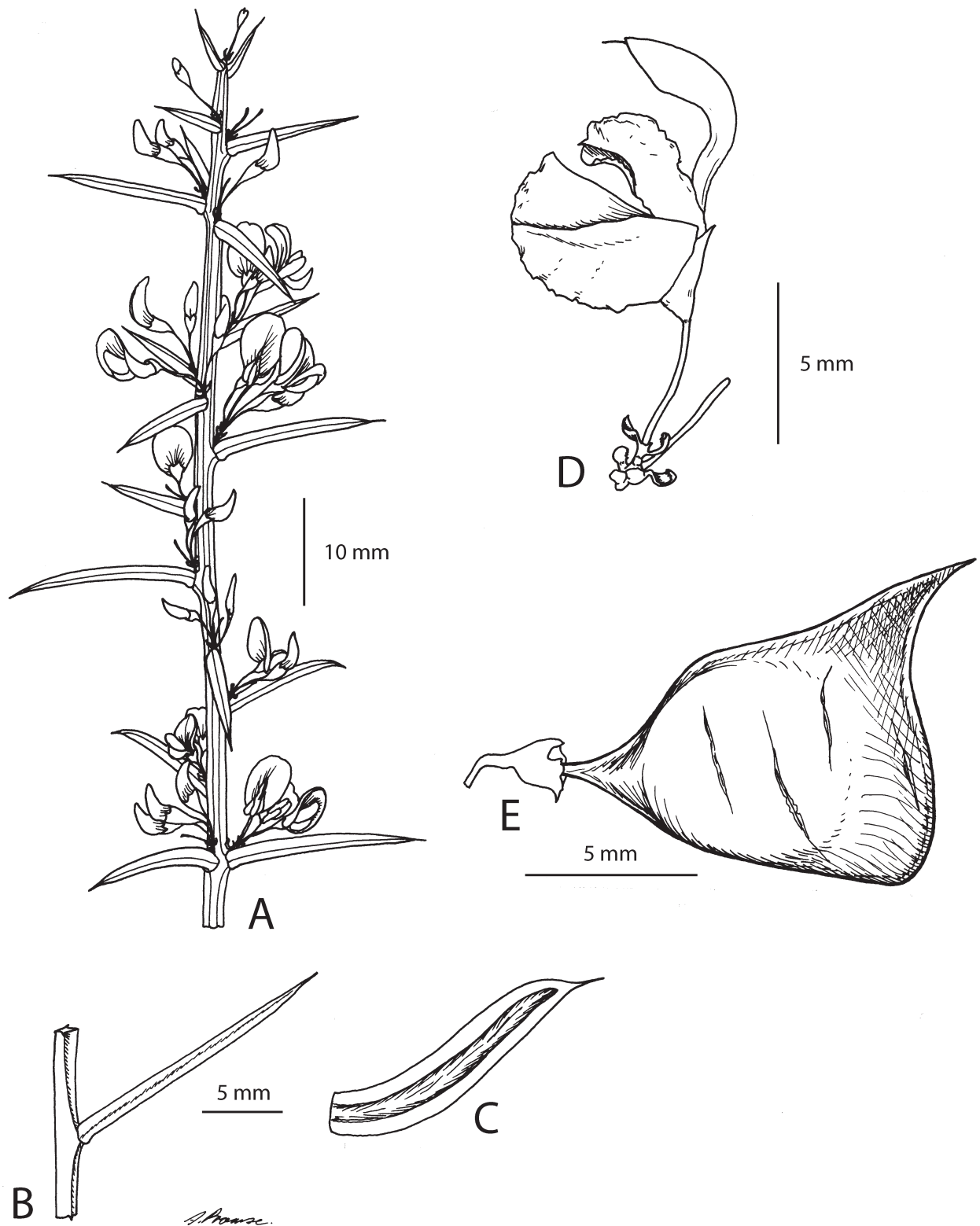
**Hybrids:**—*Daviesia angulata* × *D. polyphylla*.

**123. *Daviesia angulata*** Benth. in Lindley (1839: xiv), Crisp (1987a: 248), Crisp (1995: 1169), Wheeler *et al.* (2002: 744). Type: Swan River, *Drummond*, 1839. Holotype: K; isotype: G

Dense intricate *shrubs*, to 1.2 × 2 m, glabrous, occasionally glaucescent. *Root anatomy* unknown. *Branchlets* diverging at 30–45°, smooth and angular when fresh, with sharp ridges when dry and sometimes striate between ridges; short axillary shoots with reduced phyllodes sometimes present. *Phyllodes* diverging at 60–90°, vertically compressed, straight or slightly recurved, subulate (rarely broadest near middle), apically acicular, pungent, sometimes with shallow lateral grooves when fresh, base articulate, 10–35(–40) × 1–4 mm, smooth when fresh, with raised longitudinal nerves when dry. *Unit inflorescences* 1(2) per axil, racemose, 2–4-flowered; *peduncle* 2–6 mm long; *rachis* 1–3.5 mm long; *barren basal bracts* oblong, ca. 0.5 mm long; *subtending bracts* oblong to slightly spatulate, may be fimbriate to lacerated at the apex, ca. 0.5–1 mm long. *Pedicels* 2–7.5 mm long. *Calyx* campanulate to tapering to the base, 2.5–3 mm long including the 0.75–1 mm receptacle; lobes ca. 0.5 mm long; upper 2 lobes united higher and closer together than the lower 3; lower 3 lobes triangular. *Corolla: standard* broadly to transversely broadly obovate, with a rounded, slightly emarginate or peaked apex, with 2 small calli on either side of the central groove at the base of the lamina, 6–7 × 5–7.5 mm including the 2–2.5 mm claw, pure yellow with dark red infusion around centre, extending partway along nerves; *wings* obovate with a rounded apex, strongly auriculate, ca. 7–8 × 3 mm including the 2 mm claw, yellow tinged with red; *keel* half broadly elliptic, acute, beaked, ca. 8–8.5 × 2 mm including the 3 mm claw, yellow tinged with red. *Stamens* slightly dimorphic: inner whorl of 5 with slightly longer, angular-terete filaments and shorter, versatile anthers; outer whorl of 5 with slightly shorter, more compressed filaments and longer, basifixed anthers; filaments rigid, cohering; anthers all 2-celled. *Pod* obliquely very broadly to shallowly obtriangular with an acuminate apex, turgid, 9–16 × 7–8 mm, beaked; upper suture strongly sigmoid to straight and swept upwards; lower suture acute and broadly rounded. *Seed* obloid, ca. 4 mm long, 2.7 mm broad, 2.7 mm thick, light tan in colour; *aril* ca. 2 mm long. (Fig. 124).

**Flowering period:**—March to July. *Fruiting period:* August to October.

**Distribution:**—Western Australia, from Eneabba south to Busselton and inland through the eastern wheatbelt from Wongan Hills to Mount Barker.



**FIGURE 124.** *Daviesia angulata*. A. Flowering branchlet. B, C. Phyllodes showing variation. D. inflorescence. E. Pod. A, B, D from C. Chapman (1)77; C from Hnatiuk 770090; E from C. Chapman (101)77. Drawn by A.L. Prowse.

**Habitat:**—Occurs on sand or laterite, in jarrah (*Eucalyptus marginata*) forest or mallee-heath.

**Selected specimens (79 examined):**—WESTERN AUSTRALIA. Irwin: 23 km E of Jurien Bay, 30°14'S, 115°14'E, E.M. Bennett 2931, 21 May 1969 (CANB, PERTH); E of Cataby Creek on Mimegara Road, 30°47'S,

115°34'E, *R. Hnatiuk* 770010, 26 April 1977 (PERTH); 19 km S of Rail-crossing, ca. 29°27'S, 115°13'E, *C. Chapman* (65)77, 25 August 1977 (CBG); 2 km from turnoff near Eneabba settlement, *D. Young* 86, 15 May 1967 (PERTH). **Avon:** 10 km N of Calingiri, 31°05'S, 116°27'E, *K.M. Allan* 245, 21 May 1970 (CANB, PERTH). **Darling:** 1 km S of Mogumber, 31°06'S, 116°03'E, *C. Chapman* (1)77, 28 March 1977 (CBG); ca. 3 km S of Wannamal, 31°12'S, 116°05'E, *C. Chapman* (101)77, 17 October 1977 (CBG); east Bullsbrook, 31°40'S, 116°02'E, *R.D. Royce* 5835, 1 April 1959 (PERTH); vicinity 36 mile peg Perth–Moora road, ca. 31°30'S, 116°05'E, *C. Chapman* (69)77, 1 September 1977 (CBG). **Roe:** 12 km W of Lake Grace along the Tarin Rock Road, 33°07'S, 118°21'E, *J. Armstrong* 5015, 23 May 1983 (CBG, MEL, PERTH).

**Affinity:**—This species has often been confused with *D. preissii*, but the latter has evenly striate branchlets and phyllodes when dry, a thickened articulation at the base of the phyllode, and lacks the sharp branchlet ridges of *D. angulata*. Also, *D. preissii* differs in the inflorescence being 1- or 2-flowered with a shorter peduncle (ca. 1 mm) and the flowers are larger (e.g. standard 7.5–10 × 6.5–8 mm).

**Hybrids:**—*Daviesia angulata* × *D. polyphylla*.

**124. *Daviesia preissii*** Meisner (1844: 50), Bentham (1864: 84), Crisp (1987a: 253), Crisp (1995: 1222), Wheeler *et al.* (2002: 745). Type: 'In sublimoso-glareosis prope praedium rusticum D. Hassel (Hay) m. Febr. 1841. Herb. Preiss. No. 1153.' Lectotype (Crisp 1995: 1222): NY (incorrectly annotated 'holotype' by M.D.C.); isolectotype: G (2 sheets), LD, MEL (2 sheets), MO

*Shrubs*, often low and spreading, 0.3–1 m high and to 1 m across, glabrous, dull green. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, terete to slightly compressed, with blunt angles, wrinkled-striate when dry. *Phyllodes* scattered, diverging at 60–90°, vertically compressed, straight or slightly incurved or recurved, subulate or obliquely narrowly obovate to elliptic, apex acuminate, pungent, base cuneate, truncate, with a slightly thickened articulation, 10–40 × 0.75–5 mm, striate (obscure when fresh, clearly evident when dry). *Unit inflorescences* 1 per axil, 1- or 2-flowered; *peduncle* ca. 0.5–2.5 mm long; *subtending bracts* oblong, apex fimbriate, ca. 1 mm long. *Pedicel* 1.5–5.5 mm long, gently thickening towards the apex. *Calyx* 3–4.5 mm long including the 0.5–1.5 mm receptacle; lobes narrowly triangular, attenuate with subulate tips, ca. 1.5 mm long; upper 2 lobes united higher than the lower 3. *Corolla: standard* very broadly elliptic to very broadly obovate, apically rounded to obtusely peaked, not emarginate, 7.5–10 × 6.5–8 mm including the ca. 1 mm claw, with a prominent central groove, 2 calli present at the base of the lamina, yellow with red infusion near the centre; *wings* obliquely narrowly obovate with a rounded apex, strongly auriculate, auricles sometimes hooked, 7.5–12 × 2–2.25 mm including the 1–1.5 mm claw, red; *keel* half elliptic, acute, upper margins of lamina not or slightly rolled but never as far as the apex, slightly saccate, 8–8.5 × 2.5–3 mm including the ca. 2 mm claw, red. *Stamens* moderately dimorphic: inner whorl of 5 with longer, angular-terete filaments and shorter, subversatile anthers; outer whorl of 5 with shorter, compressed filaments and longer, basifixed anthers; filaments cohering, free; anthers all 2-celled. *Pod* obliquely very broadly to shallowly obtriangular, acute, with a persistent style, swollen towards the base but compressed at the margins and at the apex, 12–21 × 8.5–12 mm; upper suture sigmoid to obtuse; lower suture acute to obtuse. *Seed* ellipsoid, ca. 3.3 mm long, 1.9 mm broad, 1.7 mm thick, black; *aril* ca. 1 mm long. (Fig. 125).

**Flowering period:**—Any time of the year, mainly in summer. *Fruiting period:* July to January.

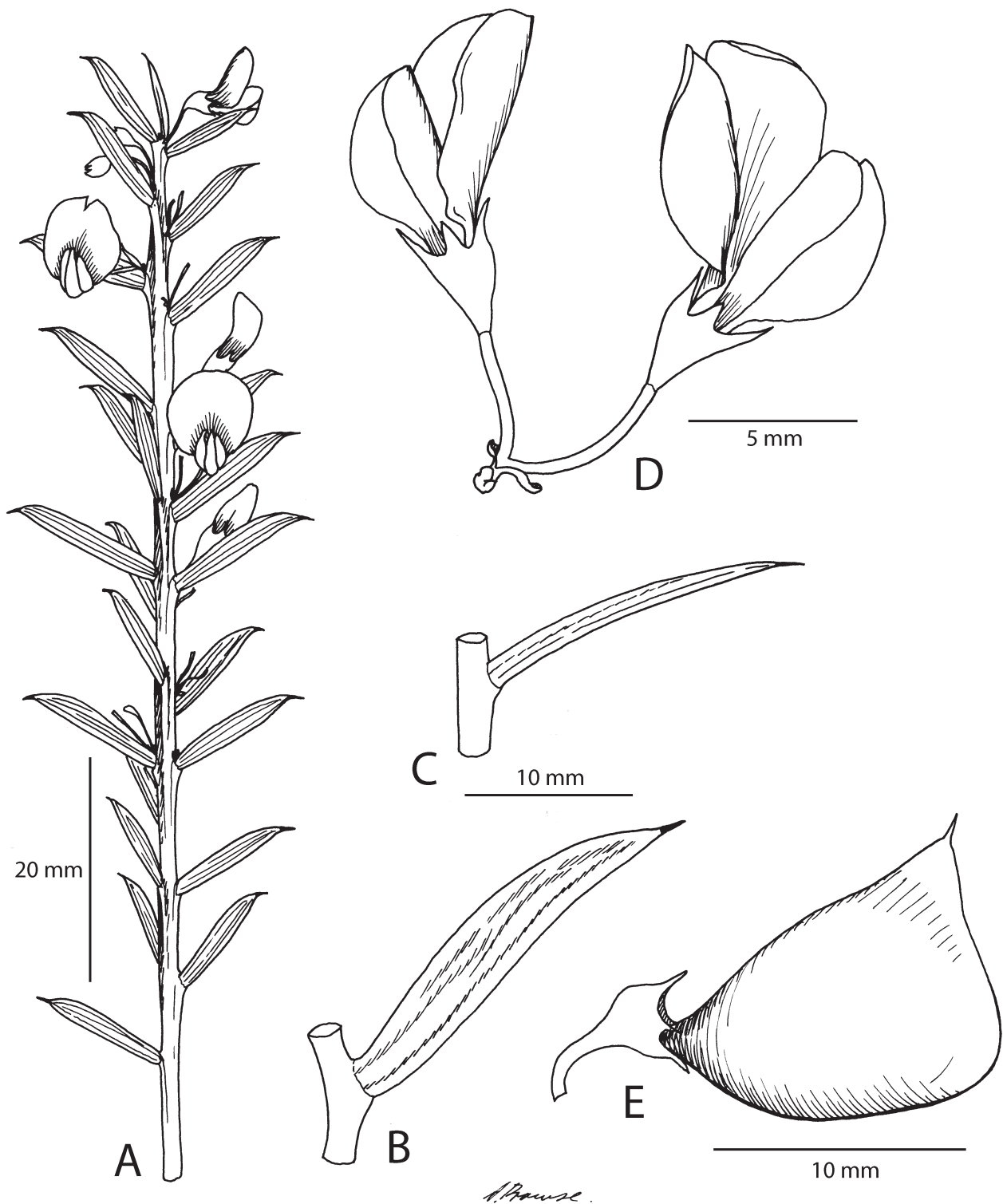
**Distribution:**—Western Australia, throughout the Darling Range, the far south-west and east to Albany and the Stirling Range.

**Habitat:**—Lateritic soils, chiefly sandy or loamy, though occasionally clayey sand, in *Eucalyptus marginata* dominated open forest, or in kwongan heathland.

**Selected specimens (81 examined):**—**WESTERN AUSTRALIA:** **Avon:** 20 km past Keenan College towards New Norcia, 31°09'S, 116°11'E, *N. Carriage* 99 & *P. Ollerenshaw*, 4 October 1975 (CBG); Cunderdin, 31°39'S, 117°14'E, *J.B. Cleland s.n.*, September 1908 (NSW 34886). **Darling:** Serpentine, 32°11'S, 115°43'E, *W.V. Fitzgerald s.n.*, September 1901 (NSW 34882); Scarp Road, S of Serpentine Pipehead Dam, 32°25'S, 116°04'E, *M.G. Corrick* 9391, 2 November 1984 (CANB, HO, MEL); 9 km NW of Williams along the Albany Highway, 32°58'S, 116°49'E, *J. Taylor* 2118 & *P. Ollerenshaw*, 22 September 1983 (CBG); near Bowelling, 33°25'S, 116°29'E, *A.R. Fairall* 1737, 29 November 1965 (PERTH); 4 km SE of Porongurup, 34°41'S, 117°57'E, *M.D. Crisp* 5226, 17 January 1979 (AD, CBG, NSW, PERTH); 11 km from Nannup along road to Busselton,



33°54'S, 115°44'E, *M.D. Crisp 5359*, 21 January 1979 (AD, CBG, MEL, PERTH); Mount Barker townsite, 34°39'S, 117°39'E, *R.D. Royce 6787*, 29 January 1962 (PERTH). **Eyre:** Boxwood Hill–Toompup road, 13 km NW from Chillilup Pool turnoff, 34°16'S, 118°30'E, *M.D. Crisp 5164*, 15 January 1979 (CBG, K, PERTH); Stirlings, *C.E. Woolcock D44*, 29 July 1981 (CBG); south of the Stirling Range, *F.J.H. von Mueller s.n.*, 2 October 1867 (MEL 80365).



**FIGURE 125.** *Daviesia preissii*. A. flowering branchlet. B, C. Phyllodes, showing variation. D. Inflorescence. E. Pod. A, D from *Crisp 5164*; B, E from *Mueller s.n.* (MEL 80365); C from *Crisp 5226*. Drawn by A.L. Prowse.

**Affinity:**—*Daviesia preissii* is often confused with *D. angulata* or *D. spinosissima*. *Daviesia angulata* differs in having sharp ridges along the branchlets when dry (the ridges are bluntly angular in fresh material), the inflorescences are 2–4-flowered, with a longer peduncle (2–6 mm), smaller flowers (e.g. standard 6–7 × 5–7.5 mm) and broader, shorter (ca. 0.5 mm) calyx lobes. *Daviesia spinosissima* has phyllodes that spread at right angles and are very crowded, with bases overlapping along the stem; also, the base of the standard lamina lacks calli and instead has saccae on the abaxial side.

**125. *Daviesia spinosissima*** Meisner (1844: 51), Bentham (1864: 85), Crisp (1995: 1238), Wheeler *et al.* (2002: 745). Type: 'In solo glareoso inter frutices prope montem Wuljenup (Plantagenet) d. 8. October 1840. Herb. Preiss. No. 1152.' Lectotype (Crisp 1995: 1238): LD; isolectotype: NY

Rigid *shrubs*, to 1.8 m high, glabrous. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending to erect, terete, prominently ribbed to wrinkled. *Phyllodes* spreading at ca. 90°, very rigid, crowded and overlapping at the bases, vertically compressed, narrowly to linearly triangular (subulate), straight or gently recurved, apex acuminate, pungent, base thickened and articulate, 7–15 mm long, 1.5–3 (4) mm broad at base, longitudinally wrinkle-ribbed, with thickened margins. *Unit inflorescences* 1 per axil, 1(2)-flowered; *peduncle* 0.5–2 mm long; *subtending bracts* appressed to the pedicel, oblong, hooded, ca. 1 mm long. *Pedicels* 3–6 mm long. *Calyx* 6–7 mm long including the ca. 2 mm receptacle; lobes ± equal, triangular, ca. 1.5 mm long, with the upper 2 lobes united higher than the lower 3. *Corolla: standard* transversely broadly ovate, emarginate, cordate, abaxially saccate at the base of the lamina, 9.5–11 × 11–12 mm including the 1.5–2 mm claw, with 2 small calli at the base of the lamina, yellow; *wings* spatulate with a rounded, incurved apex, enclosing the keel, auriculate, 9.5–10 × 4–4.5 mm including the 2–2.5 mm claw, red; *keel* half very broadly ovate, beaked, auriculate, strongly saccate, 8.5–9 × 2–2.25 mm including the 4–4.5 mm claw, red. *Stamens* weakly dimorphic: inner whorl of 5 with longer, terete filaments and shorter, versatile anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, basifixed anthers; filaments all compressed, cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, acute with a pungent tip, turgid, 10–13 × 7–8 mm; upper suture sigmoid; lower suture acute and broadly rounded. *Seed* not seen. (Fig. 126).

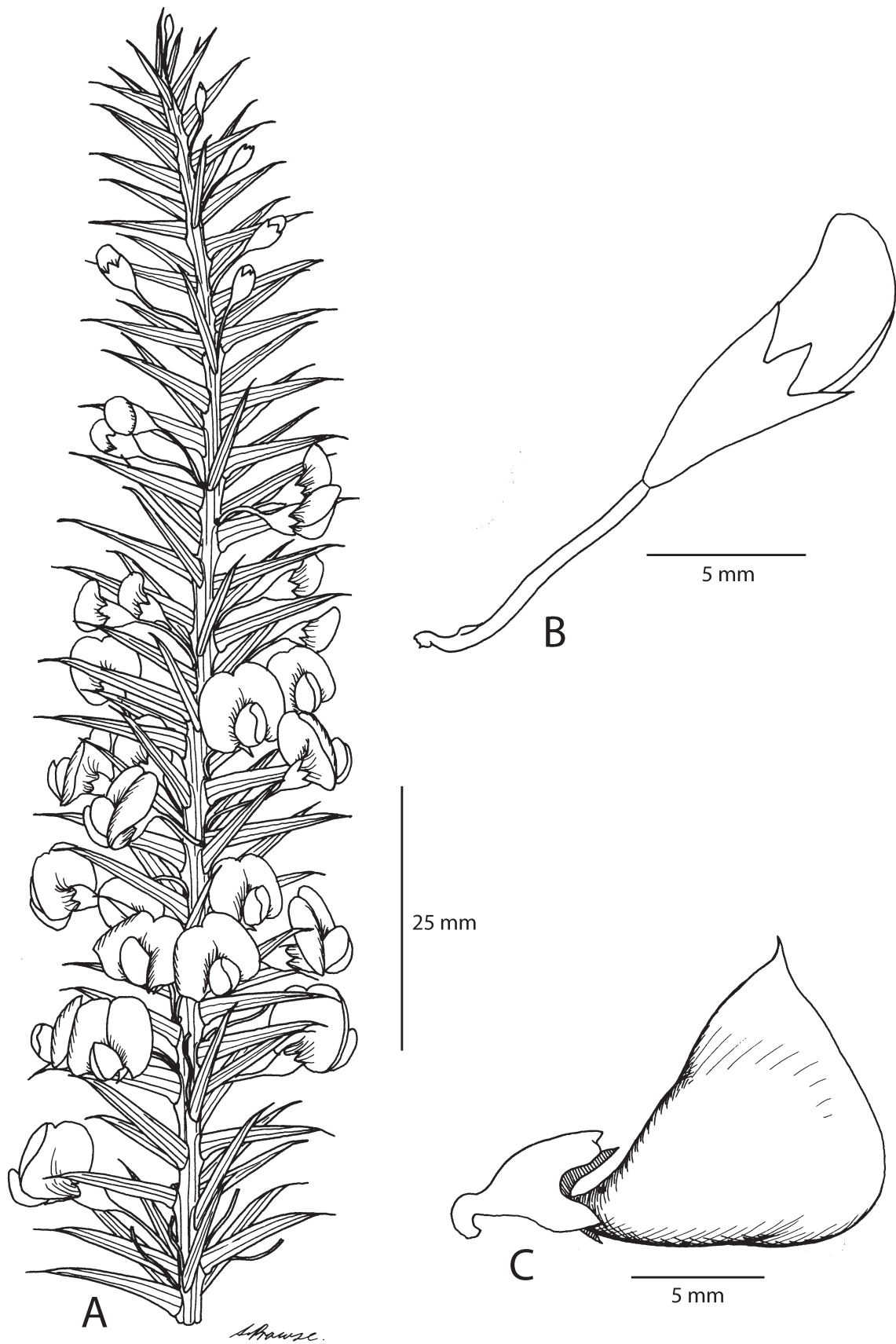
**Flowering period:**—October to March. *Fruiting period:* January to October.

**Distribution:**—Western Australia, south coast, from Narrikup south-west to near Denmark and east to Mt Manypeaks and Cheyne Beach turnoff.

**Habitat:**—Sand or gravel in heath with emergent eucalypts such as *E. staeri* and shrubs such as *Hakea*, *Kingia*, *Melaleuca* and *Taxandria* (Bentham 1867: 97) Wheeler & Marchant (2007: 406).

**Selected specimens (18 examined):**—WESTERN AUSTRALIA. **Darling:** 6 km W of Narrikup, 34°46'S, 117°38'E, *R.T. Lange 289a*, 4 March 1958 (PERTH); Nornalup, 35°00'S, 116°49'E, *H. Steedman s.n.*, November 1930 (PERTH 5201632). **Eyre:** Mt Manypeaks area, ca. 34°54'S, 118°15'E, *S.P. Pfeiffer s.n.* (PERTH 5475627); ca. 50 km along Highway 1 from Albany to Jerramungup, 0.5 km SW of Cheyne Beach turnoff, 34°49'S, 118°15'E, *M.D. Crisp 5076*, 13 January 1979 (CBG, K, MEL); 21 km N of Albany, 34°54'S, 117°46'E, *K. Newbey 1227*, 20 January 1964 (PERTH); 0.5 km SW of Cheyne Beach turnoff on Highway No. 1 between from Albany and Jerramungup, 34°30'S, 118°36'E, *M.D. Tindale 306 & B.R. Maslin*, 22 March 1970 (NSW, PERTH).

**Affinity:**—*Daviesia preissii* is similar to *D. spinosissima*, but differs in having slightly ascending (though gently falcate) phyllodes that are not overlapping along the branchlets, and the standard has calli at the base of the lamina but lacks saccae on the outside at the base. Superficially, *D. angulata* resembles *D. spinosissima*, but has angular branchlets with sharp, raised ridges, and the phyllodes are not crowded along the branchlets and lack a thickened articulation at the base; also, the inflorescences are racemose and 2–4-flowered with a longer peduncle (2–6 mm) and smaller flowers (e.g. standard 6–7 × 5–7.5 mm).



**FIGURE 126.** *Daviesia spinosissima*. A. Flowering branchlet. B. Inflorescence (1-flowered). C. Pod. A from *Tindale 306*; B from *Crisp 5076*; C from *Newbey 1227*. Drawn by A.L. Prowse.

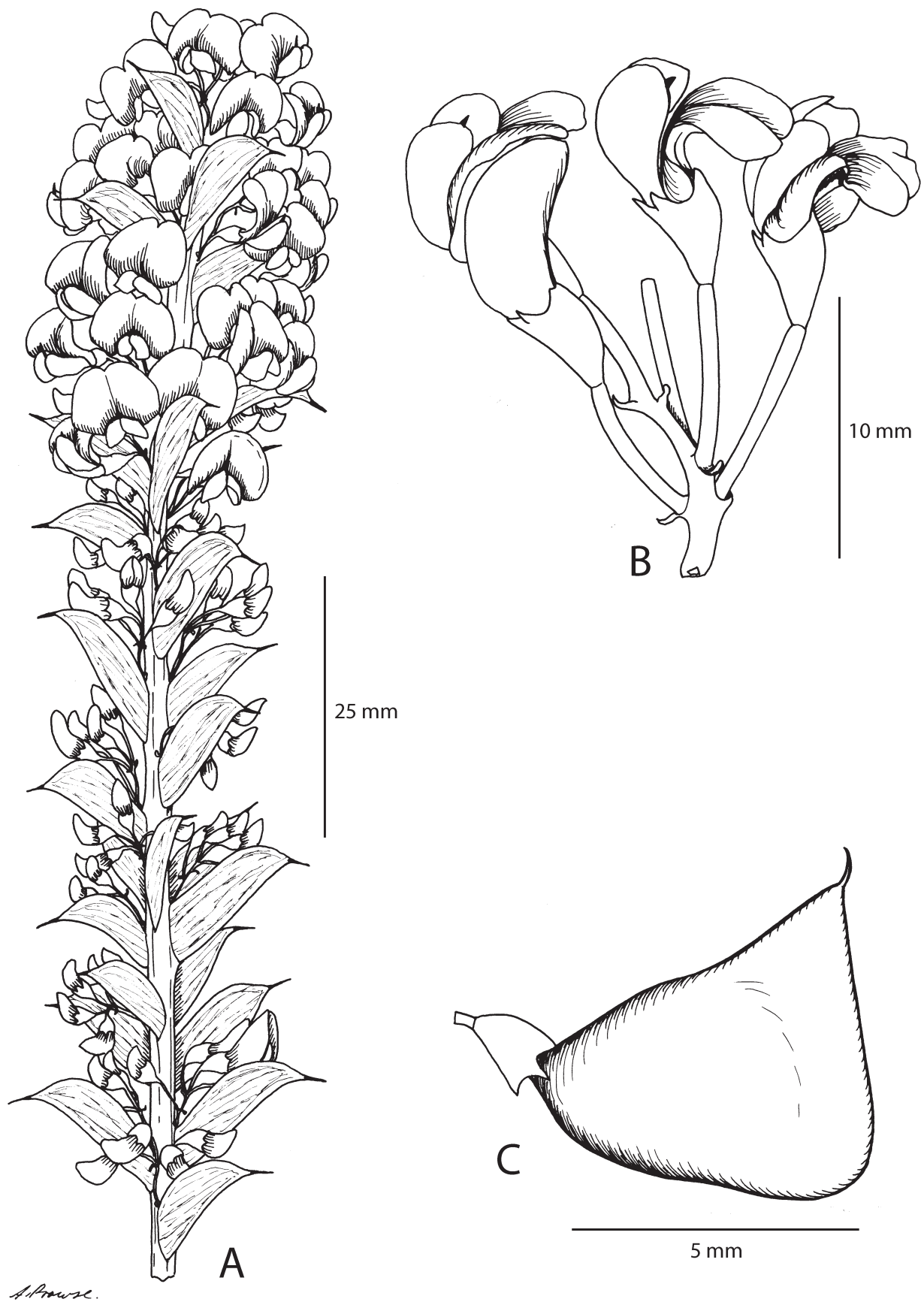


FIGURE 127. *Daviesia striata*. A. Flowering branchlet. B. Inflorescence. C. Pod. A–C from *Crisp 5104*. Drawn by A.L. Prowse.

**126. *Daviesia striata*** Turczaninow (1853: 264), Bentham (1864: 85), Crisp (1995: 1238). Type: 'Drum. IV. n. 29.' Holotype: KW; isotypes: BM, G (2 sheets), K (4 sheets), MEL, OXF, P (2 sheets)

*Daviesia adnata* Mueller (1860: 105). Type: 'Ad sinum South-West Bay Novae Hollandiae austro-occidentalis. Maxw.' Holotype: MEL; isotype: OXF.

Rigid open *shrubs*, to 1.2 m high, glabrous, glaucous to pruinose. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ascending, somewhat angular with longitudinal ridges, wrinkled when dry. *Phyllodes* very crowded with the bases overlapping, diverging at ca. 45°, vertically compressed, either recurved or almost straight and then recurved at the apex, obliquely oblong with the adaxial margin ± dilated, apex acuminate with the fiercely pungent tip projecting horizontally or slightly decurved, base articulate, 7–16 × 4–6.5 mm, fairly smooth when fresh, longitudinally wrinkled-striate when dry. *Unit inflorescences* 1 per axil, racemose, 4–7-flowered; *peduncle* 2–3.5 mm long; *rachis* 2.5–4.5 mm long; *basal barren bracts* forming an involucre at the base of the peduncle, ca. 0.25 mm long; *subtending bracts* spreading with upcurved tips, oblong, ca. 1 mm long. *Pedicels* 3.5–7 mm long. *Calyx* ca. 4 mm long including the 1.5–2 mm receptacle; lobes ca. 1 mm long; upper 2 lobes ± united into a lip; lower 3 lobes triangular. *Corolla: standard* very broadly elliptic to transversely so, emarginate, apex recurved, often strongly, 7.5–9 × 7.5–8.5 mm including the ca. 1 mm claw, 2 prominent, long calli present, beginning at the base of the lamina, yellow with a narrow red ring surrounding the yellow centre; *wings* obliquely elliptic with a rounded apex, auriculate, pinched at the junction of the claw and auricle so that the lamina opens out to expose the keel, ca. 8 × 3.5 mm including the 2 mm claw, red, fading to yellow at the very tips; *keel* half very broadly ovate, beaked, auriculate, saccate, ca. 6.5–7.5 × 1.75 mm including the 3–3.5 mm claw, red. *Stamens* moderately dimorphic: inner whorl of 5 with longer, angular-terete filaments and shorter, versatile to subversatile anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, basifixed anthers; filaments cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, acuminate, somewhat turgid, 10–12 × 8–9 mm; upper suture straight to curved upwards; lower suture acute. *Seed* not seen. (Fig. 127).

**Flowering period:**—Any time of the year. **Fruiting period:** One specimen seen fruiting in September.

**Distribution:**—Western Australia, south coast, from Bremer Bay east to East Mt Barren.

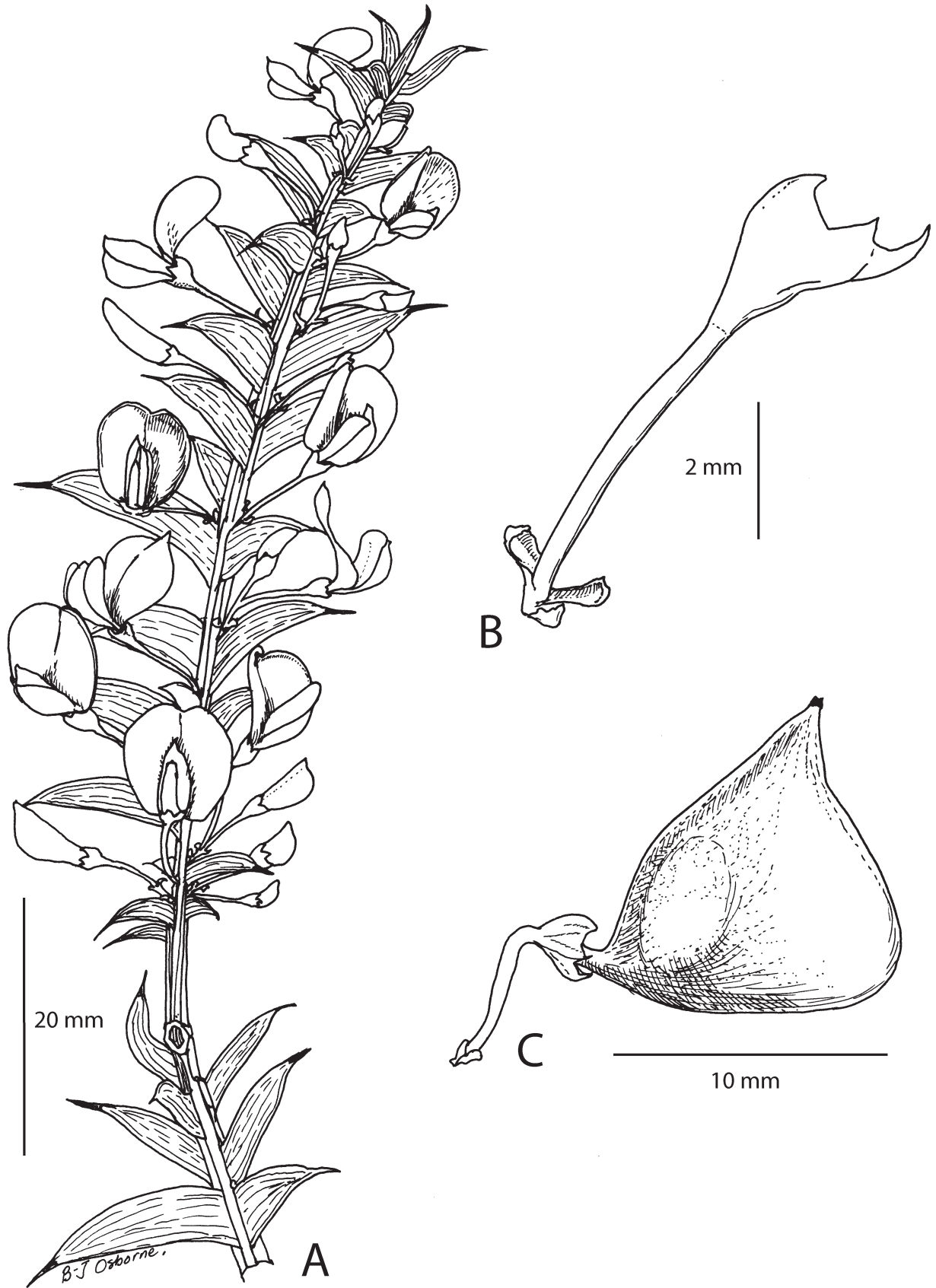
**Habitat:**—Usually in coastal heath communities on flat or undulating landscapes, or ridges overlooking the sea; on sand, sometimes gravelly, over laterite or quartzite.

**Selected specimens (25 examined):**—**WESTERN AUSTRALIA.** **Eyre:** 3 km W of Bremer Bay, 34°24'S, 119°21'E, *K. Newbey* 3027, 1964 (PERTH); 34°03'S, 119°41'E, *C.A. Gardner* 12109, 13 February 1959 (PERTH); Fitzgerald River National Park, 7 km SW of Annie Peak, 33°53'S, 119°55'E, *M.D. Crisp* 5014, 11 January 1979 (CBG, MEL, PERTH); Fitzgerald River National Park, Hammersley Drive near junction with track to Mylies Beach, 33°57'S, 119°58'E, *J. Taylor* 1725 & *P. Ollerenshaw*, 12 September 1983 (CBG, MEL).

**Affinity:**—This species is distinctive but very similar to *D. chapmanii*, especially in the phyllode morphology and pale yellow to whitish colour of the standard-petal. However, *D. chapmanii* differs in having multiple sharp raised ridges along the dried branchlets, whereas branchlets of *D. striata* are angular and smooth (longitudinally wrinkled when dry); also, the phyllodes of *D. chapmanii* are narrower (2.5–4 mm) and more attenuate (tending to be triangular rather than oblong), and dull green rather than pruinose or glaucous. *Daviesia preissii* and *D. spinosissima* also have crowded phyllodes but they are much narrower than in *D. striata* (0.75–5 mm broad in *D. preissii*, 1.5–2 mm broad in *D. spinosissima*), are straight or gently falcate, and are not glaucous.

**127. *Daviesia chapmanii*** Crisp (1995: 1181). Type: Western Australia, Irwin, 16 km N of Hill River bridge along Brand Hwy, 30°15'S, 115°26'E, *M.D. Crisp* 6213, *J. Taylor* & *R. Jackson*, 29 September 1979. Holotype: CBG; isotypes: NSW, PERTH

Dense, rounded *shrubs*, to 0.8 m high and 1.5 m broad, glabrous, dull dark green. *Root anatomy* unknown. *Branchlets* spreading to ascending, terete, striate *in vivo* with multiple sharp longitudinal ridges. *Phyllodes* very crowded, their broad bases overlapping along branchlets, diverging at 60–110°, vertically compressed, oblong to triangular, usually narrow, often slightly oblique or recurved, slightly thickened along margins, apically acuminate, pungent, articulate at the base, (7.5–)10–15(–20) × 2.5–4 mm, striate (prominently when dry), dull green. *Unit inflorescences* 1(2) per axil, racemose, 1–4-flowered; *peduncle* 0.5–1.5(–14) mm long, very thick when > 2 mm long; *rachis* 0.25–1(–2) mm long; *barren basal bracts* narrowly oblong, ca. 0.5 mm long, numerous, overlapping at



**FIGURE 128.** *Daviesia chapmanii*. A. Flowering branchlet. B. Inflorescence (1-flowered) with floral parts except calyx removed. C. Pod. A, B from *C. Chapman* (6B)77, C from *C. Chapman* (83)77. Drawn by B-J. Osborne. Adapted from Crisp (1995) with permission from CSIRO Publishing.

the base of the peduncle except when the peduncle is  $> 2$  mm long, where they are scattered; *subtending bracts* oblong, hooded, slightly keeled, ca. 1 mm long. *Pedicels* gently dilated upwards, 3–5.5 (8) mm long. *Calyx* 3–3.5 mm long including the 1.25–1.5 mm receptacle (sometimes markedly stipe-like); lobes subulate; upper 2 lobes united into a narrow, truncate lip,  $< 0.5$  mm long; lower 3 lobes triangular, ca. 0.75 mm long. *Corolla* pale yellow to almost white with deep pink markings; *standard* broadly obovate to broadly elliptic with a rounded apex, contracted at base, 8–8.5  $\times$  6–9 mm including the 0.5–1 mm claw, 2 large calli present at the base of the lamina, pale yellow with a red centre; *wings* narrowly obovate with a rounded apex, sometimes slightly oblique, with hooked auricles, 7–8  $\times$  2–2.5 mm including the 1–1.5 mm claw, red; *keel* half broadly ovate, acuminate with an acicular beak, auriculate, ca. 7–8  $\times$  1.75–2 mm including the ca. 3 mm claw, yellow. *Stamens* slightly dimorphic: inner whorl of 5 with longer, ca. terete filaments and shorter, versatile anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, basifixed anthers; filaments cohering towards base; anthers all 2-celled. *Pod* obliquely very broadly to shallowly obtriangular with an acute apex, turgid, 12–14  $\times$  9–10 mm; upper suture almost straight to slightly sigmoid; lower suture acute but broadly rounded. *Seed* globose to obloid, ca. 3 mm long, 2 mm broad, 1.6 mm thick, brown to black; *aril* ca. 1 mm long. (Fig. 128).

**Flowering period:**—Mostly April and May, occasionally in August. *Fruiting period:* Mostly September and October, occasionally in August.

**Distribution:**—Western Australia, a restricted distribution from Eneabba south to Badgingarra and inland to near Carnamah.

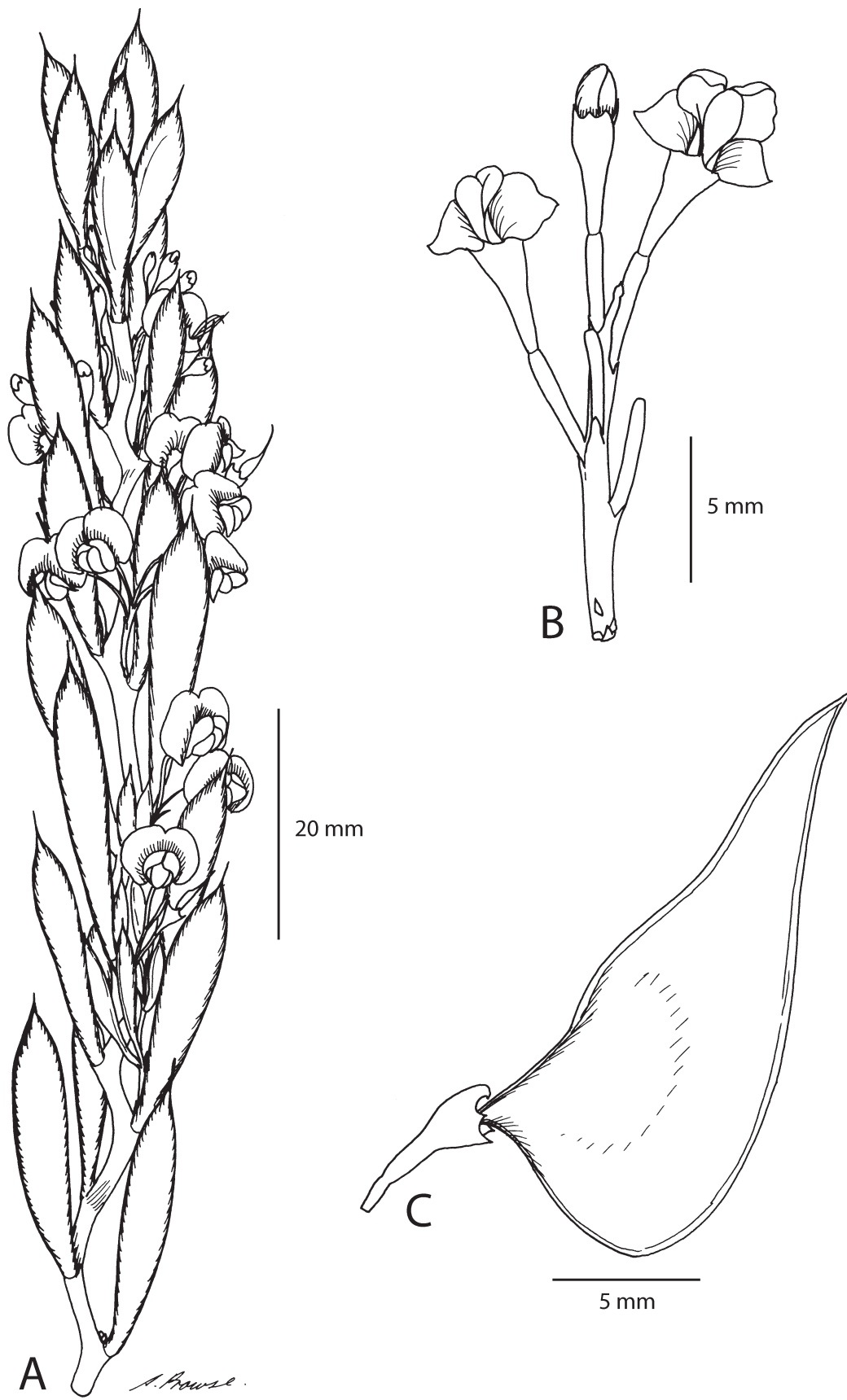
**Habitat:**—Grows in sand, sandy gravel or gravelly clay over laterite on undulating terrain in kwongan heathland.

**Selected specimens (14 examined):**—WESTERN AUSTRALIA. **Irwin:** Winchester West, 29°46'S, 115°56'E, *C. Chapman s.n.*, 18 April 1969 (CBG 484000, PERTH); 1 mile [1.5 km] E of Brand Highway on Coorow Green Head Road, 30°05'S, 115°23'E, *C. Chapman (6B)77*, 15 May 1977 (PERTH); 42 km W of Winchester, 29°47'S, 115°35'E, *C. Chapman (83)77*, 18 September 1977 (CBG, PERTH); Mt Peron, 30°07'S, 115°09'E, *C.A. Gardner 9420*, 26 August 1949 (PERTH); junction of Brand Highway and Jurien Bay Road, 30°11'S, 115°23'E, *R. Hnatiuk 770002*, 26 April 1977 (PERTH); Cadda Road, 5.9 km E of junction with Munbinea Road, 30°23'S, 115°17'E, *S. Patrick 1318*, 20 October 1992 (CANB, PERTH).

**Affinity:**—This species belongs to a large natural group within the genus exemplified by *D. incrassata*, with which it shares turgid pods, a distinctive calyx that is flared from just below the teeth, an incurved beaked keel, weakly dimorphic stamens and cord roots. Within the *D. incrassata* group, it belongs to a smaller group having striate phyllodes (when dry) with thickened margins and narrow, usually sharp ridges along the branchlets (including *D. angulata*, *D. mesophylla*, *D. microphylla*, *D. polyphylla*, *D. preissii* and *D. spinosissima*). However, only this species, *D. microphylla*, *D. spinosissima* and *D. striata* have very crowded phyllodes whose broad bases overlap along the branchlets. *Daviesia microphylla* differs in having spinescent branchlets and phyllodes  $\leq 5$  mm long. *Daviesia spinosissima* differs in having subulate phyllodes that are thickened at the basal articulation. Superficially, *D. striata* is most similar to *D. chapmanii*: the phyllodes are similar in shape, and they overlap along the branchlets; however, the *D. striata* plant is glaucous to pruinose and the branchlets are longitudinally wrinkled (when dry), whereas in *D. chapmanii* they have multiple sharp ridges, even *in vivo*.

**128. *Daviesia crassa*** Crisp (1995: 1183). Type [approximate locality data given because the species is rare]: Western Australia, Avon, SW of Harrismith, 33°S, 117°40'E, *M.D. Crisp 5531*, 28 January 1979. Holotype: CBG, 2 sheets; isotypes: K, L, NSW, PERTH

Compact dense *shrubs* to 1.8 m high, glabrous, glaucous to pruinose. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* spreading to ascending, usually flexuose with crowded phyllodes, smooth when fresh, longitudinally wrinkled when dry; occasional shoots are long and straight with scattered slender phyllodes. *Phyllodes* crowded (rarely scattered), erect, thick, clavate (rarely linear-fusiform), terete, apically acuminate, pungent, tapering to the articulate base, 10–40 mm long, 2–6 mm diam., appearing succulent but filled with pith, smooth when fresh, longitudinally wrinkled when dry. *Seedling phyllodes* flattened at nodes 1–3, becoming terete by node 10. *Unit inflorescences* 1 per axil, racemose, 3–5(–8)-flowered; *peduncle* 3.5–6 mm long; *rachis* 4–11 mm long; *subtending bracts* appressed, ovate, ca. 0.5–1 mm long. *Pedicels* gently dilated upwards, 2–4 mm long. *Calyx* narrowly campanulate, 4–5 mm long including 2–2.5 mm stipe-like receptacle; upper 2 lobes united in a truncate,



**FIGURE 129.** *Daviesia crassa*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 5531* (type); C from *Crisp 6147*. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.



emarginate lip, ca. 1 mm long; lower 3 minute, deltoid, ca. 0.5 mm long. *Corolla* pure yellow; *standard* very broadly ovate, emarginate, margins recurved, slightly cordate, 4–4.5 × 5.5–6 mm including the ca. 0.5 mm claw; *wings* spatulate, with lower margins divergent and apices rounded and incurved but not overlapping, scarcely auriculate, ca. 4.5 × 2.5 mm including the 1 mm claw; *keel* half depressed-obovate, scarcely acute, auriculate, saccate, ca. 4.5 × 2 mm including the 1.5 mm claw. *Stamens* weakly dimorphic and ca. uniform in length; inner whorl of 5 with slender, angular filaments and shorter anthers; outer whorl of 5 with broader, compressed filaments and longer anthers; filaments free; anthers all basifixed and 2-celled except vexillary anther versatile with confluent thecae. *Pod* obliquely shallowly obtriangular, beaked, compressed, ca. 20 × 7 mm; upper suture undulating; lower suture scarcely acute. *Seed* not seen. (Fig. 129).

**Flowering period:**—Only specimen flowering in January. **Fruiting period:** One specimen seen fruiting in September.

**Distribution:**—Western Australia, south-central wheatbelt, between Wagin and Harrismith.

**Habitat:**—Grows in white, sometimes gravelly, sand over laterite, in undulating terrain in kwongan heath.

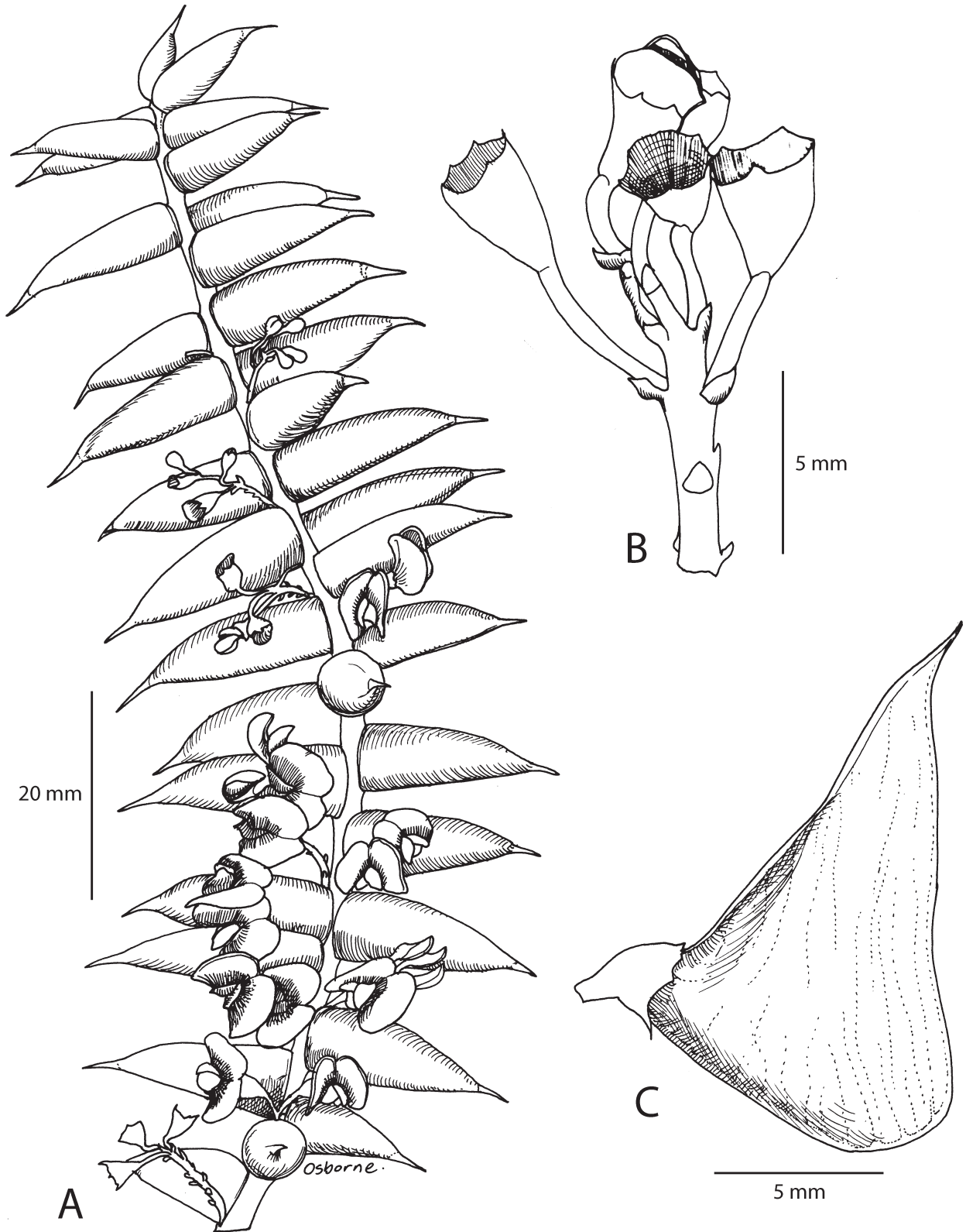
**Conservation status:**—National: Not listed. WA: Priority 4, adequately known and near-threatened or not threatened, requiring regular monitoring.

**Additional specimens examined:**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA. Avon:** SW of Harrismith, 33°S, 117°40'E, *L.R. Frizell s.n. & K. Morrison*, 4 August 1964 (PERTH 5200539); *ibid.*, *M.D. Crisp 5533*, 28 January 1979, seedling (CBG); *ibid.*, *M.D. Crisp 6147 et al.*, 26 September 1979 (CBG, PERTH); near Wagin, 33°20'S, 117°20'E, *Cronin s.n.*, 1890 (MEL 81103 and 81105); source of the Blackwood River, 33°40'S, 116°50'E, *Cronin s.n.*, 1889 (MEL 81106).

**Affinity:**—This bizarre plant looks more like a member of the Crassulaceae than a legume. However, the thick, club-shaped phyllodes are filled with dry pith, not with succulent tissue. No other *Daviesia* could be confused with this species. There is, however, an apparent relationship with *D. pachyphylla*, which also has thick, pith-filled phyllodes, as well as similar inflorescences and flowers. *Daviesia pachyphylla* is readily distinguished by the phyllodes diverging at 90° from the branchlet and not tapering to the base, the slightly larger flowers (e.g. standard 7–8 mm broad) with intense maroon markings on the petals, and the more or less equilateral pods. Moreover, *D. pachyphylla* has an open, spindly habit.

**129. *Daviesia pachyphylla*** Mueller (1863: 15), Bentham (1864: 82), Crisp (1995: 1220). Type: 'In montibus juxta flumina Gardner et Phillips River. Maxw.' Holotype: MEL; isotype: K

Slender (or occasionally compact) *shrubs* to 1.5 m high, glabrous, glaucous to pruinose. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* spreading to ascending, often arching, terete, smooth except for phyllode scars, commonly pruinose. *Phyllodes* crowded with bases overlapping along branchlet, diverging at 45–90°, thick, terete, usually narrowly conical, i.e. tapering from a broad base to acuminate apex, occasionally also slightly constricted at base, often slightly recurved at apex, pungent, articulate at base, 12–27 mm long, 4–10 mm diam. at base, appearing succulent but filled with pith, smooth, glaucescent to pruinose. *Seedling phyllodes* becoming larger over the first 4 or 5 nodes, the first 3 nodes 8–9 × 1–1.5 mm, then transitory over the next 3 or 4 nodes to mature size; cotyledons present even when plant is 1200 mm high, elliptic, ca. 11 × 4 mm. *Unit inflorescences* 1 per axil, racemose, 2–7-flowered; *peduncle* often quite thick (up to 1 mm), 0.5–5 mm long; *rachis* 1.25–6 mm long; *subtending bracts* ± appressed, acuminate to oblong, entire or lacerated at the apex, 0.5–2 mm long. *Pedicels* 2–4.5 mm long. *Calyx* 3.5–4 mm long including the ca. 1 mm receptacle; upper 2 lobes united in a truncate, scarcely emarginate lip, ca. 0.5 mm long, lead grey tending to pruinose; lower 3 lobes acuminate, minute (< 0.25 mm long). *Corolla: standard* transversely elliptic, emarginate, cordate, 5.5–6 × 6.5–8 mm including the 1.5–2 mm claw, yellow to orange with a dark red-brown centre; *wings* oblong to obovate, apex rounded and incurved to enclose the keel, auriculate, with another lobe opposite on the abaxial margin, 4.5–7 × 2–3 mm including the 1.5–2 mm claw, red to dark red-brown; *keel* half very broadly obovate, acute, auriculate, saccate, 4–5 × 2 mm including the ca. 1.5 mm claw, red to dark red-brown. *Stamens* strongly dimorphic: inner whorl of 5 with slightly longer, terete filaments and round, versatile anthers with confluent thecae; outer whorl of 5 with slightly shorter, compressed filaments and oblong, basifixed, 2-celled anthers; filaments free. *Pod* obliquely shallowly obtriangular, acuminate, compressed, 13–14 × 8.5–9 mm; upper suture slightly sigmoid; lower suture acute. *Seed* not seen. (Fig. 130).



**FIGURE 130.** *Daviesia pachyphylla*. A. Flowering branchlet. B. Inflorescence. C. Pod. A, B from *Crisp 5531* (type); C from *Crisp 6147*. Drawn by B-J. Osborne.

**Common name:**—Ouch Bush.

**Flowering period:**—July to October. *Fruiting period:* Immature fruits from August, mature from November to January.

**Distribution:**—Western Australia, mainly near the coast from Fitzgerald River National Park (including the Barrens) north to Ongerup and east to Ravensthorpe and Munglinup.

**Habitat:**—Grows on sandy or gravelly laterite in heath dominated by *Allocasuarina*, *Eucalyptus*, *Hakea* and *Banksia*.

**Selected specimens (37 examined):**—WESTERN AUSTRALIA. **Eyre:** 11 km from Ravensthorpe, near Esperance turnoff on Ravensthorpe–Hopetoun road, 33°37'S, 120°09'E, *F. Lullfitz* 5293, 3 August 1966 (CANB, PERTH); 25 km NNW of Ravensthorpe, North Road, 1 km N of junction with Hayes Road, 33°22'S, 119°59'E, *M.D. Crisp* 4992, 10 January 1979 (CBG, PERTH); near Dempster Inlet, Fitzgerald River Reserve, 20 km from coast, 33°37'S, 120°09'E, *E.C. Nelson ANU* 16729, 5 October 1972 (CANB, PERTH); Mt Desmond, 11 km SE of Ravensthorpe, 33°37'S, 120°09'E, *M.D. Crisp* 4949, 8 January 1979 (CBG); Boat Harbour, 34°31'S, 118°49'E, *N.G. Marchant* 70/243, 14 August 1970 (PERTH). **Roce:** Jerramungup, 33°57'S, 118°54'E, *C.E. Woolcock* D43, 31 July 1981 (CBG). **CULTIVATED.** Australian National Botanic Gardens, ex. W.A., 11 km SE of Ravensthorpe, Mt Desmond, *M.D. Crisp* 4949, 8 January 1980, seedling (CBG).

**Affinity:**—This species has thick phyllodes that are packed with pith, and as such is similar only to *D. crassa*, which differs in having erect, clavate phyllodes (i.e. proportionally narrower and always tapering to the base) and smaller flowers (e.g. standard is ca. 6 mm broad) that are pure yellow with no darker markings.

**130. *Daviesia euphorbioides*** Bentham (1864: 88), (Crisp 1995: 1193). Type: 'W. Australia, Drummond, 3rd Coll. n. 76.' Lectotype (Crisp 1995: 1193): K (ex Herb. Hooker); isolectotype: BM, G, K (ex Herb. Bentham), K (ex LINN), MEL, P (2 sheets), W

Open, erect to sprawling, cactus-like *subshrubs*, to 0.8 m high, glabrous, glaucous to pruinose. *Root anatomy* unknown. *Branchlets* mostly erect, terete, thick (6–10 mm diam.), appearing fleshy but filled with pith, smooth when fresh and longitudinally ribbed or wrinkled when dry. *Phyllodes* scattered and inconspicuous, ascending, divaricate or recurved, reduced to small spines tapering to an acicular pungent apex, 0.5–2.5(–5) mm long, 1–1.5 mm broad at the inarticulate base. *Juvenile phyllodes* leaf-like, elliptic, apically rounded with a small mucro, constricted to a petiole-like base, continuous with the branchlet, 18–20 × 7–11 mm; outer margins thickened, midvein apparent, strongly wrinkled when dry. *Unit inflorescences* 1 per axil, very condensed and crowded racemes, 3–6-flowered; *peduncle* 0.5–1.5 mm long; *rachis* < 0.5 mm long; *barren basal bracts* numerous, clustered in an involucre at the base of the peduncle, to 0.75 mm long, broader than subtending bracts; *subtending bracts* ascending, oblong, tips fimbriate, to 1 mm long. *Pedicel* 1–1.5 mm long. *Calyx* 3–4 mm long including the 1–1.5 mm receptacle; upper 2 lobes united into a broad, truncate lip, usually < 0.5 mm long; lower 3 lobes triangular, ca. 0.5 mm long; lobes slightly flared towards the apex. *Corolla: standard* very broadly obovate, emarginate, 7.5–9 × 6–8.5 mm including the 1–2 mm claw, with 2 thickened calli at the base of the lamina, bright yellow with a dark red-brown centre; *wings* obovate with a rounded, slightly incurved apex, auriculate, 6.5–7.5 × 2–3 mm including the 1.5–2 mm claw, maroon; *keel* half very broadly ovate, acute and slightly rounded apex, auriculate, saccate, 6.5–9 × 2–2.5 mm including the 3.5–5 mm claw, maroon. *Stamens* slightly dimorphic: inner whorl of 5 with longer, slender, terete filaments and shorter, rounder, versatile anthers; outer whorl of 5 with shorter, broader, compressed filaments and longer, oblong, basifixed anthers; filaments cohering towards the base; anthers all 2-celled. *Pods* obliquely very broadly to shallowly obtriangular, wedge-shaped, acute, somewhat turgid, 13–16 × 10–12 mm; upper suture upwardly curved; lower suture acute to 90°. *Seed* not seen. (Fig. 131).

**Common name:**—Wongan Cactus.

**Flowering period:**—July to September. *Fruiting period:* September to January.

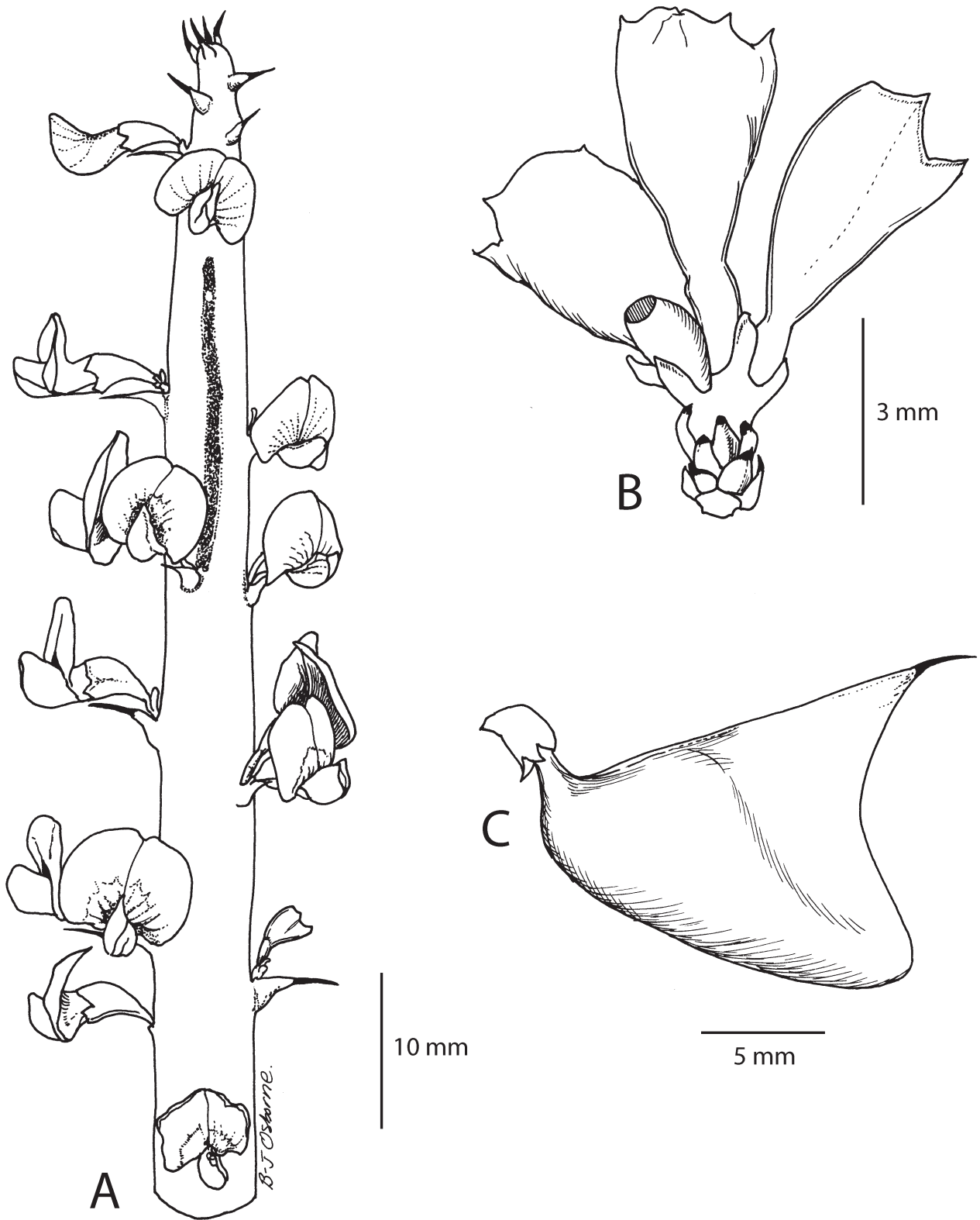
**Distribution:**—Western Australia, north-central wheatbelt, recorded from an area delimited by Wongan Hills, Dowerin and Moonijin.

**Habitat:**—Grows in rocky loam to deep sand in disturbed areas around gravel pits, and along roadsides and railway lines, in heath with *Allocasuarina campestris* and *Callitris*. This species is short-lived and is possibly an obligate re-seeder following fire.

**Conservation status:**—National: Endangered. WA: Critically Endangered, Declared Rare Flora.

**Selected specimens (18 examined):**—Approximate locality data given because the species is rare. **WESTERN AUSTRALIA, Avon:** Wongan Hills area, 30°50'S, 116°40'E, *M.D. Crisp* 6320, *et al.*, 2 October 1979 (CBG); *ibid.*, *M.D. Crisp* 6520, 17 July 1980 (CBG); *ibid.*, *C.A. Gardner* 12457, 7 August 1960 (PERTH);

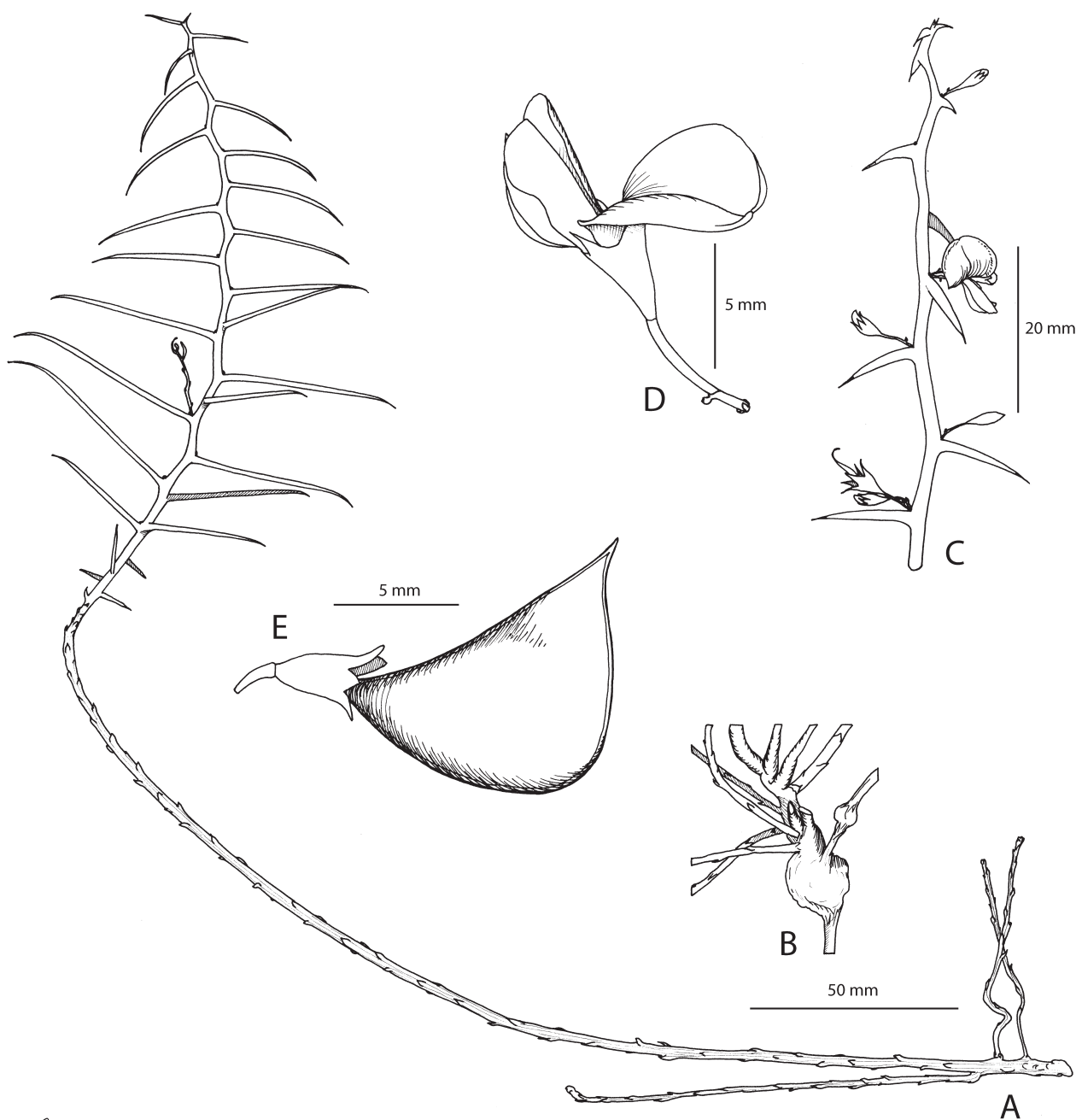
*ibid.*, C.A. Gardner s.n., 5 September 1924, juvenile material present (PERTH 05212286) ; *ibid.*, 32°52'S, 116°42'E, J. Taylor 2172 & P. Ollerenshaw, 23 September 1983 (CBG, MEL); Moonijin area, 31°S, 117°10'E, M.D. Crisp 6684, 23 July 1980 (CBG, K, PERTH).



**FIGURE 131.** *Daviesia euphorbioides*. A. Flowering branchlet. B. Inflorescence with flowers represented by calyces only. C. Pod. A, B from Crisp 6520; C from Crisp 6320. Drawn by B-J. Osborne.

**Affinity:**—The unique cactus-like habit makes this species unlikely to be confused with any other in *Daviesia*. In particular, all other species have much thinner branchlets that are woody and not filled with parenchyma.

**131. *Daviesia rhizomata*** Crisp (1995: 1230). Type: Western Australia, Roe, 26 km NNE of Hyden, 32°13'S, 118°55'E, *M.D. Crisp* 5558, 29 January 1979. Holotype: CBG; isotypes: K, NSW, PERTH



**FIGURE 132.** *Daviesia rhizomata*. A. Rhizome terminating in an aerial branchlet. B. Root crown with a lignotuber. C. Flowering branchlet. D. Inflorescence (1-flowered). E. Pod. A, B from *Crisp* 5558 (type). C–E from *Crisp* 5543. Drawn by A.L. Prowse. Adapted from Crisp (1995) with permission from CSIRO Publishing.

Low *shrubs* with numerous stems in tufts arising from enlarged rootstocks (lignotubers) from which strongly differentiated rhizomes spread to establish new plants, glabrous, glaucescent to bluish. *Root anatomy* with anomalous secondary thickening (cord type). *Branchlets* ± erect, flexuose, smooth when fresh, striate when dry. *Phyllodes* scattered, widely spreading or slightly retrorse, terete, apex often slightly recurved, acicular, pungent, inarticulate, 4–45 mm long, 1–2 mm diam., smooth when fresh, striate when dry. *Unit inflorescences* 1 per axil, 1-flowered; *peduncle* 1–2 mm long; *rachis* nil; *barren basal bracts* very small, forming an involucre, ca. 0.25 mm

long; *subtending bracts* ascending, oblong, ca. 0.75 mm long. *Pedicels* geniculate, 1–3 mm long. *Flowers* gaping as the keel deflexes to expose the stamens. *Calyx* narrowly campanulate, 4–5 mm long including the ca. 1 mm stipitate receptacle; lobes acuminate, upper 2 united higher than the lower 3, ca. 1.75 mm long. *Corolla: standard* very broadly ovate, slightly reflexed with incurved margins, emarginate, callose, ca. 7 × 7–9 mm including the 1.5 mm claw, with 2 small calli at the base of the lamina, yellow with red infusion at the base and an intensely yellow vertical central streak; *wings* narrowly obovate, slightly lobed on abaxial margin towards apex, apically incurved, auriculate, ca. 7 × 2.5 mm including the 1.5 mm claw, red with yellow tips; *keel* half elliptic, deflexed to expose the stamens, acute, with adaxial margins involute, ca. 8 × 2 mm including the 2.5 mm claw, red and yellow. *Stamens* weakly dimorphic: inner whorl of 5 with subdorsifixed, smaller anthers; outer whorl of 5 with basifixed, longer anthers; filaments uniform in length, all compressed and cohering; anthers all 2-celled. *Pod* obliquely shallowly obtriangular, acute, somewhat turgid, 11–13 × 6–7 mm; upper suture slightly sigmoid; lower suture ca. 90° to scarcely obtuse. *Seed* not seen. (Fig. 132).

**Flowering period:**—January and February. *Fruiting period:* Unknown.

**Distribution:**—Western Australia, centred on Hyden and extending west towards Kulin, east into unoccupied mallee country and south to the Lake Grace–Newdegate area.

**Habitat:**—Grows in gravelly sandy laterite or sand over laterite on flat areas in diverse tall heath including *Acacia*, *Allocasuarina campestris*, *Banksia*, *Gastrolobium*, *Grevillea*, *Leptospermum* and *Melaleuca*.

**Additional specimens examined:**—WESTERN AUSTRALIA. **Roe:** 16 km SE of Kulin, 32°43'S, 118°16'E, *R. Hnatiuk 780044*, 12 January 1978 (PERTH); ca. 55 km E of Hyden, 3 km NE of Marble Rocks, 32°30'S, 119°26'E, *M.D. Crisp 5552*, 29 January 1979 (CBG, PERTH); ca. 50 km NE of Lake Grace, 16 km E of Pingaring, 32°45'S, 118°48'E, *M.D. Crisp 5543*, 28 January 1979 (AD, CBG, L, MEL, MO, PERTH); 33 km E of Pingaring along road to Varley, 32°44'S, 118°57'E, *M.D. Crisp 5546*, 29 January 1979 (AD, CBG, PERTH); 6.4 km W along Jilakin Flat Rocks Road from Holt Rock South Road, 2 km W of S tip of Lake Varley, 32°42'S, 119°20'E, *M.D. Crisp 9002*, 22 October 1996 (CBG).

**Affinity:**—Superficially there seems little to distinguish *D. rhizomata* from the many species of *Daviesia* with terete, pungent phyllodes. However, this species has some distinctive diagnostic characters, especially the rhizomes. While rhizomes are not unique to this species, they appear more developed than in other *Daviesia* species. They are produced so freely that in the field the plants form networks of interconnected tufts and clumps. *Daviesia scabrella* is vegetatively similar with a low, spreading rhizomatous or stoloniferous growth habit but the phyllodes are green (not bluish) and have a minutely scabrid epidermis; also, the floral morphology differs, e.g. the margins of the standard are recurved and the central yellow mark is shaped like a starburst.

*Daviesia rhizomata* is quite similar to *D. uncinata*, and though the distributions of these species partially overlap, there is no sign of intergradation. *Daviesia uncinata* may be distinguished by the tufted, non-rhizomatous growth habit, usually ascending uncinately phyllodes, 2-several-flowered racemes, smaller flowers (standard 4–5 mm broad; calyx 2.5–3 mm long) and the uncinately, acicular-beaked keel.

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## Appendix I. Samples used for DNA sequencing

Newly submitted GenBank accession numbers are KY418612–KY418733 (ITS), KY418734–KY418832 (*ndhF*) and KY426135–KY426256 (*trnL*–*trnF*). Accession numbers for sequences from previous studies are also listed below. A minus symbol indicates missing data. Latitude and longitude are in decimal degrees. Geocodes for taxa of conservation concern are rounded to the nearest 0.1°. Vouchers are in CANB.

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	<i>ndhF</i>	<i>trnL</i> – <i>trnF</i>
Outgroups							
<i>Erichsenia uncinata</i>	Crisp 8524	WA: 47 km from Newdegate towards Lake King.	-33.091	119.509	AF287663	-	AF518133
<i>Viminaria juncea</i>	Crisp 8935	WA: Wright Road, SE of Margaret River.	-34.127	115.239	AF287664	KY418734	AF518134
Ingroup							
<i>Daviesia acicularis</i>	Crisp 9119	NSW: 5 km from Colo Heights towards Windsor.	-33.406	150.78	AY233087	KY418735	KY426135
<i>D. alata</i>	Crisp 9148	NSW: Hanging Rock Swamp, Penrose State Forest.	-34.636	150.202	-	KY418736	KY426136
<i>D. alternifolia</i>	Crisp 8967	WA: Stirling Range, c. 3 km directly NW of Barnett Peak.	-34.329	117.86	AY233088	-	-
<i>D. anceps</i>	Crisp 8992	WA: 7.6 km WSW of Mt Desmond along track to Moir Road.	-33.64	120.073	AY233089	KY418737	KY426137
<i>D. angulata</i>	Crisp 9241	WA: 16 km N of Hill River Bridge along Brand Highway.	-30.229	115.411	AY233090	KY418738	KY426138
<i>D. aphylla</i>	Crisp 9319	SA: 4 km N of Kyancutta along road to Wudinna East.	-33.094	135.561	KY418612	KY418739	KY426139
<i>D. aphylla</i>	Crisp 9399	WA: 37 km from Balladonia along Eyre Highway towards Norseman.	-32.181	123.283	AY233093	KY418741	KY426141
<i>D. aphylla</i>	Crisp 9410	SA: 10.9 km directly NNE of Taylorville.	-34.039	140.051	KY418613	KY418740	KY426140
<i>D. aphylla</i>	Crisp 9434	WA: 15 km from Corrigin along road to Brookton.	-33.359	117.727	KY418614	KY418742	KY426142
<i>D. aphylla</i>	Crisp 9538	WA: 35.3 km at 116 deg. from Salmon Gums.	-32.846	121.972	KY418615	KY418743	KY426143
<i>D. apiculata</i>	Crisp 9358	WA: Harrismith town limits, 0.5 km E of Post Office.	-32.935	117.863	KY418616	-	-
<i>D. apiculata</i>	Crisp 9523	WA: Cape Le Grand National Park, trail from Lucky Bay to Thistle Cove.	-33.998	122.218	KY418617	-	-
<i>D. arborea</i>	Crisp 9167	Cultivated: Australian National Botanic Gardens.	-35.28	149.11	AY233091	-	-

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Appendix I. (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. arenaria</i>	<i>Crisp 9311</i>	SA: 4.0 km from Arno Bay turnoff along Princes Highway towards Cowell.	-33.895	136.597	KY418618	KY418744	KY426144
<i>D. argillacea</i>	<i>Crisp 9205</i>	WA: 1 km NW of Mt Heywood.	-33.325	122.524	KY418619	-	-
<i>D. arthropoda</i>	<i>George 12088</i>	WA: between Anne Range and Walter James Range.	-24.7	128.8	KY418621	-	-
<i>D. arthropoda</i>	<i>Crisp 9790</i>	NT: 67.5 km E of Yulara along Lasseter Highway.	-25.263	131.601	KY418620	KY418745	KY426145
<i>D. articulata</i>	<i>Crisp 8999</i>	WA: 23 km along road from Ravensthorpe to Hopetoun.	-33.726	120.193	AY233092	KY418746	KY426146
<i>D. articulata</i>	<i>Crisp 9489</i>	WA: 25 km from Borden along road to Albany.	-34.272	118.205	KY418622	-	-
<i>D. asperula</i> subsp. <i>obliqua</i>	<i>Crisp 9313</i>	SA: 4.0 km from Koppio Museum along road to Warunda.	-34.448	135.813	KY418623	KY418747	KY426147
<i>D. audax</i>	<i>Crisp 9182</i>	WA: 15.5 km E from Newdegate along road to Lake King.	-33.097	119.181	KY418624	KY418748	KY426148
<i>D. benthamii</i>	<i>Crisp 10048</i>	WA: Wongan Hills town site, Xmas Rocks walk.	-30.883	116.718	KY418627	-	KY426150
<i>D. benthamii</i>	<i>George 10183</i>	WA: 14.5 km S of Gnaraloo homestead.	-23.93	113.517	KY418628	-	KY426151
<i>D. benthamii</i>	<i>George 11582</i>	WA: E of Mystery Well, Dirk Hartog Island.	-25.65	113.03	KY418629	-	KY426152
<i>D. benthamii</i>	<i>Keighery 2041</i>	WA: Koolanooka Hills, 18 km E of Morawa.	-29.217	116.217	KY418625	KY418749	KY426149
<i>D. benthamii</i>	<i>Chapman (120)77</i>	WA: 9 km WSW of Winchester.	-29.8	115.86	KY418626	-	-
<i>D. brachyphylla</i>	<i>Crisp 9181</i>	WA: 15.5 km E from Newdegate along road to Lake King.	-33.097	119.181	AY233095	KY418750	KY426153
<i>D. brevifolia</i>	<i>Crisp 9317</i>	SA: Eyre Peninsula, ca. 11 km E of Warrow.	-34.369	135.552	KY418630	-	-
<i>D. brevifolia</i>	<i>Crisp 9407</i>	SA: Mount Lofty Range, Aldgate–Mylor Road.	-35.028	138.753	KY418631	-	-
<i>D. bursarioides</i>	<i>Crisp 9269</i>	WA: near Three Springs.	-29.6	115.7	KY418632	KY418751	KY426154
<i>D. buxifolia</i>	<i>Crisp 9136</i>	Cultivated: Australian National Botanic Gardens.	-35.28	149.11	KY418633	KY418752	KY426155
<i>D. campephylla</i>	<i>Crisp 9329</i>	WA: Rollond Road, 7.1 km W from junction with Neds Corner Road.	-33.281	121.037	KY418634	KY418753	KY426156

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Appendix I. (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. campephylla</i>	Crisp 9529	WA: 6.0 km N along Neds Corner Road from Cascades Road.	-33.431	121.106	KY418635	KY418754	KY426157
<i>D. cardiophylla</i>	Crisp 9357	WA: 2.6 km S along Wedin South Road from turnoff from Line Road.	-32.993	117.682	KY418636	-	KY426158
<i>D. chapmanii</i>	Crisp 9247	WA: 1.3 km E of Brand Highway along Coorow–Green Head Road.	-30.052	115.34	AY233097	KY418755	KY426159
<i>D. cordata</i>	Crisp 8908	WA: 0.2 km E along Helena Road from West Talbot Road towards York.	-31.963	116.537	AY233098	KY418756	KY426160
<i>D. corymbosa</i>	Crisp 9124	NSW: West Cliff Colliery turn-off, Appin–Bulli road.	-34.239	150.681	AY233099	KY418757	KY426161
<i>D. crassa</i>	Crisp 9356	WA: SW of Harrismith.	-33.0	117.7	KY418637	KY418758	KY426162
<i>D. crenulata</i>	Crisp 9454	WA: Stirling Range, junction of East Pillenorup and South Bluff tracks.	-34.418	118.253	KY418638	KY418759	KY426163
<i>D. croniniana</i>	Crisp 9392	WA: 17 km E of Southern Cross along Great Eastern Highway.	-31.275	119.492	KY418639	KY418760	KY426164
<i>D. cunderdin</i>	Crisp 9367	WA: near Cunderdin.	-31.5	117.3	KY418640	KY418761	KY426165
<i>D. daphnoides</i>	Crisp 9013	WA: 20.8 km E of Brand Highway at Eneabba along road to Carnamah.	-29.804	115.464	AY233100	KY418762	KY426166
<i>D. decipiens</i>	Crisp 9215	WA: 24 km W of Ravensthorpe along road to Jerrumungup.	-33.645	119.813	KY418641	KY418763	KY426167
<i>D. decurrens</i> subsp. <i>decurrens</i>	Crisp 9008	WA: near Chittering, Maddern Road, c. 70 km N of Perth.	-31.46	116.062	AY233101	KY418764	KY426168
<i>D. decurrens</i> subsp. <i>decurrens</i>	Crisp 9369	WA: Carburnup townsite reserve.	-33.705	115.184	KY418642	-	-
<i>D. devito</i>	Crisp 931	SA: Wilpena Pound.	-31.6	138.6	KY418643	-	-
<i>D. devito</i>	Crisp 9318	SA: Eyre Peninsula, near Lock.	-33.6	135.8	KY418644	-	KY426169
<i>D. devito</i>	Crisp 9409	SA: N of Nuriootpa.	-34.5	139.0	KY418645	KY418765	KY426170
<i>D. devito</i>	Crisp 9422	NSW: near West Wyalong.	-33.8	147.2	KY418646	KY418766	-
<i>D. devito</i>	Crisp 9557	Vic.: near Inglewood.	-36.6	143.9	KY418647	-	-
<i>D. dilatata</i>	Crisp 8989	WA: 1.5 km SW of Mt Desmond.	-33.621	120.148	AY233102	KY418767	KY426171
<i>D. discolor</i>	Purdie 4390	Qld: near Tambo.	-24.8	146.9	KY418648	-	-
<i>D. discolor</i>	Crisp 9578	Qld: Blackdown Tableland.	-23.8	149.1	KY418649	KY418768	-

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Appendix I. (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. divaricata</i> subsp. <i>divaricata</i>	Crisp 9383	WA: Road opposite Whitford Shopping Centre, Perth.	-31.797	115.746	KY418651	KY418770	KY426173
<i>D. divaricata</i> subsp. <i>lanulosa</i>	Crisp 9377	WA: 23.1 km N of Geraldton central roundabout along highway to Carnavon.	-28.594	114.632	KY418650	KY418769	KY426172
<i>D. elliptica</i>	Crisp 9051	NSW: ca. 6 km from Mt Lindesay Highway along road to Boonoo Boonoo Falls.	-28.856	152.147	AF518099	-	AF518130
<i>D. elongata</i>	Crisp 9368	WA: near Busselton.	-33.7	115.2	KY418652	-	KY426174
<i>D. emarginata</i>	Crisp 8962	WA: Stirling Range, Salt River Road.	-34.312	117.997	AY233104	-	-
<i>D. emarginata</i>	Crisp 9455	WA: Stirling Range, 18 km E of Chester Pass Road.	-34.418	118.253	KY418653	-	KY426175
<i>D. epiphyllum</i>	Crisp 9245	WA: 1.3 km of Brand Hwy along Coorow–Green Head Road.	-30.052	115.34	AY233105	KY418771	KY426176
<i>D. eremaea</i>	Van Leeuwen 4924	WA: Little Sandy Desert, 33.7 km SSE of Cooma Well.	-24.384	120.403	KY418654	-	-
<i>D. euphorbioides</i>	Crisp 9384	WA: near Dowerin	-31.2	116.9	KY418655	-	-
<i>D. filipes</i> subsp. <i>filipes</i>	Crisp 2747	Qld: 2 km WSW of Mt Castletower.	-24.16	151.28	KY418656	-	-
<i>D. filipes</i> subsp. <i>filipes</i>	Crisp 9568	Qld: 12 km along Burnett Hwy towards Mundubbera from Eidsvold.	-25.436	151.192	-	KY418772	-
<i>D. flava</i>	Telford 12054	Qld: ca. 33 km NW of Cooktown.	-15.3	145.01	KY418657	-	KY426177
<i>D. flexuosa</i>	Crisp 8976	WA: 0.5 km S of Narrikup on road to Chorkerup.	-34.78	117.70	AY233106	KY418773	KY426178
<i>D. flexuosa</i>	Crisp 9344	WA: 2.2 km along Millstream Road from Albany Highway.	-34.848	117.771	KY418658	-	-
<i>D. genistifolia</i>	Crisp 9142	NSW: Federal Hwy, 0.5 km NE of Sutton turnoff.	-35.189	149.227	AY233107	KY418774	KY426179
<i>D. genistifolia</i>	Crisp 9309	SA: Flinders Ranges, Mambray Creek.	-32.823	138.061	KY418659	KY418775	KY426180
<i>D. genistifolia</i>	Crisp 9421	NSW: 15.7 km due 68 deg. (ENE) from Boorowa.	-34.41	148.883	KY418660	-	KY426181
<i>D. genistifolia</i>	Crisp 9559	Vic.: 6.6 km N of Chiltern along road to Howlong.	-36.095	146.618	KY418661	-	KY426182

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Appendix I. (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. genistifolia</i>	<i>Crisp 11676</i>	Qld: ca. 22 km WSW of Milmerran, Antonios Road.	-27.908	151.046	-	-	KY426183
<i>D. glossosema</i>	<i>Crisp 9411</i>	WA: Stirling Range.	-34.4	118.3	KY418662	KY418776	KY426184
<i>D. gracilis</i>	<i>Crisp 8953</i>	WA: Stirling Range, Ellen Peak.	-34.347	118.337	AY233108	KY418777	KY426185
<i>D. grahamii</i>	<i>Crisp 9395</i>	WA: 33 km E of Southern Cross P.O.	-31.297	119.66	KY418663	KY418778	KY426186
<i>D. grossa</i>	<i>Crisp 9429</i>	WA: Mt Ragged.	-33.445	123.466	KY418664	KY418779	KY426187
<i>D. hakeoides</i> subsp. <i>hakeoides</i>	<i>Crisp 9250</i>	WA: 21 km from NW Coastal Hwy along road to Kalbarri.	-27.876	114.513	KY418665	KY418780	KY426188
<i>D. hakeoides</i>	<i>Crisp 9374</i>	WA: 5.2 km from Marchagee along road to Coorow.	-30.008	116.089	KY418666	-	-
<i>D. horrida</i>	<i>Crisp 9371</i>	WA: 3.0 km from Dunsborough P.O. along road to Cape Naturaliste.	-33.596	115.087	KY418667	KY418781	KY426189
<i>D. implexa</i>	<i>Crisp 9360</i>	WA: near Lake Grace.	-33.1	118.6	KY418668	KY418782	KY426190
<i>D. incrassata</i> subsp. <i>incrassata</i>	<i>Crisp 9174</i>	WA: near Tarin Rock	-33.108	118.212	KY418669	KY418783	KY426191
<i>D. incrassata</i> subsp. <i>incrassata</i>	<i>Crisp 9323</i>	WA: 53 km E of Esperance along Fisheries Road towards Israelite Bay.	-33.744	122.368	KY418670	-	-
<i>D. intricata</i> subsp. <i>xiphophylla</i>	<i>Crisp 9394</i>	WA: 18.3 km E of Southern Cross P.O.	-31.275	119.507	KY418671	-	-
<i>D. lancifolia</i>	<i>Crisp 9327</i>	WA: ca. 60 km directly NW of Esperance.	-33.581	121.354	KY418672	KY418784	KY426192
<i>D. latifolia</i>	<i>Crisp 9130</i>	NSW: 2.9 km from Bundanoon Railway Stn along road to Penrose.	-34.67	150.274	AY233110	KY418785	KY426193
<i>D. leptophylla</i>	<i>Crisp 9145</i>	NSW: Tallong, between Marulan and Bundanoon.	-34.72	150.077	AY233111	-	KY426194
<i>D. lineata</i>	<i>Crisp 9361</i>	WA: E of Newdegate.	-33.1	119.2	KY418673	KY418786	KY426195
<i>D. localis</i>	<i>Hort 3903</i>	WA: N of Bindoon.	-31.2	116.3	KY418674	-	-
<i>D. longifolia</i>	<i>Crisp 9246</i>	WA: 1.3 km E of Brand Highway along Coorow–Green Head Road.	-30.052	115.34	KY418675	KY418787	KY426196
<i>D. major</i>	<i>Crisp 9515</i>	WA: Lucky Bay, Cape Le Grand National Park.	-33.992	122.218	KY418676	-	KY426197
<i>D. megacalyx</i>	<i>Crisp 8986</i>	WA: near Ravensthorpe.	-33.6	120.2	AY233112	KY418788	KY426198
<i>D. mesophylla</i>	<i>Crisp 9352</i>	WA: Stirling Range.	-34.4	118.3	KY418677	KY418789	KY426199
<i>D. microcarpa</i>	<i>Crisp 9322</i>	WA: near Norseman.	-32.2	121.8	KY418678	KY418790	KY426200
<i>D. microcarpa</i>	<i>Crisp 9697</i>	WA: near Southern Cross.	-31.3	119.3	KY418679	KY418791	KY426201

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Appendix I. (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. mimosoides</i> subsp. <i>mimosoides</i>	<i>Crisp 9151</i>	NSW: Brindabella Range, 4.8 km S of Picadilly Circus.	-35.393	148.795	AY883356	AY883267	AY883184
<i>D. mollis</i>	<i>Crisp 8988</i>	WA: Ravensthorpe Range.	-33.619	120.157	AY233114	KY418792	KY426202
<i>D. nematophylla</i>	<i>Crisp 8984</i>	WA: Ravensthorpe.	-33.577	120.055	AY233115	KY418793	KY426203
<i>D. nematophylla</i>	<i>Crisp 9387</i>	WA: 25.0 km E of Wyalkatchem along road to Trayning.	-31.187	117.949	KY418680	-	-
<i>D. nova-anglica</i>	<i>Crisp 9137</i>	NSW: Gibraltar Range National Park, Mulligan's Hut.	-29.51	152.35	AY233116	KY418794	KY426204
<i>D. nudiflora</i> subsp. <i>amplectens</i>	<i>Crisp 9034</i>	WA: Namalcatching Nature Reserve.	-31.182	117.19	AY233117	KY418795	KY426205
<i>D. obovata</i>	<i>Crisp 8948</i>	WA: eastern Stirling Range	-34.4	118.3	AY233118	-	KY426206
<i>D. oppositifolia</i>	<i>Crisp 9480</i>	WA: Stirling Range, track to Mt Hassell.	-34.378	118.075	KY418681	-	KY426207
<i>D. oxylobium</i>	<i>Crisp 9366</i>	WA: near Quairading.	-32.1	117.8	KY418682	-	KY426208
<i>D. pachyloma</i>	<i>Crisp 9025</i>	WA: 37 km E of Wongan Hills.	-30.864	117.09	AF287662	AY883268	AF518131
<i>D. pachyloma</i>	<i>Crisp 9390</i>	WA: 6.5 km from Merredin P.O. along road to Nungarin.	-31.433	118.262	KY418683	-	-
<i>D. pachyphylla</i>	<i>Crisp 8985</i>	WA: Mt Desmond, eastern slope.	-33.611	120.163	AY233119	-	-
<i>D. pachyphylla</i>	<i>Crisp 9213</i>	WA: 18 km SW of Ravensthorpe on Moir Road.	-33.718	119.971	KY418684	-	KY426209
<i>D. pauciflora</i>	<i>Crisp 9520</i>	WA: N of Esperance.	-33.8	121.9	KY418685	-	KY426210
<i>D. pectinata</i>	<i>Crisp 9315</i>	SA: southern Eyre Peninsula.	-34.3	135.9	KY418686	KY418796	KY426211
<i>D. pectinata</i>	<i>Crisp 9556</i>	Vic.: Little Desert National Park.	-36.5	141.8	KY418687	-	-
<i>D. pedunculata</i>	<i>Crisp 9242</i>	WA: 16 km N of Hill River Bridge on Brand Hwy.	-30.23	115.41	KY418688	KY418797	KY426212
<i>D. physodes</i>	<i>Crisp 8940</i>	WA: ca. 15 km directly SE of Busselton	-33.747	115.493	AY233094	-	KY426213
<i>D. pleurophylla</i>	<i>Crisp 9380</i>	WA: near Exmouth.	-21.9	114.1	KY418689	KY418798	KY426214
<i>D. podophylla</i>	<i>Crisp 9244</i>	WA: Intersection of Brand Hwy and Coorow–Green Head Road.	-30.06	115.33	AY233120	KY418799	KY426215
<i>D. preissii</i>	<i>Crisp 9338</i>	WA: 5 km E along E Pillenorup Track from Chester Pass Road, Stirling Range.	-34.451	118.119	KY418690	-	-
<i>D. preissii</i>	<i>Crisp 9370</i>	WA: Carunup townsite.	-33.71	115.18	KY418691	KY418800	KY426216

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**Appendix I.** (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. pseudophylla</i>	Crisp 9453	WA: Stirling Range.	-34.4	118.3	KY418692	KY418801	KY426217
<i>D. pteroclada</i>	Crisp 9010	WA: near Green Head.	-30.1	115.2	KY418693	KY418802	-
<i>D. purpurascens</i>	Crisp 6168	WA: 18 km ENE of Kondinin.	-32.45	118.46	KY418694	-	KY426218
<i>D. purpurascens</i>	Crisp 9396	WA: Gnarlbine Rock.	-31.136	120.93	KY418695	KY418803	KY426219
<i>D. purpurascens</i>	Crisp 9397	WA: Gnarlbine Rock.	-31.136	120.93	KY418696	KY418804	KY426220
<i>D. quadrilatera</i>	Crisp 9373	WA: Marchagee Track, near intersection with Wilcocks Road.	-30.152	115.745	KY418697	KY418805	KY426221
<i>D. ramosissima</i>	Crisp 9376	WA: 23.5 km from Dongara along road to Mingenew.	-29.213	115.15	KY418698	-	-
<i>D. reclinata</i>	Slee 2686	NT: ca. 4 km S of El Sharana.	-13.55	132.5	KY418700	-	KY426222
<i>D. reclinata</i>	Mitchell 2954	WA: Truscott airbase Anjou Peninsula.	-14.08	126.08	KY418701	-	KY426223
<i>D. reclinata</i>	Coate 335	WA: 20km NNW of Charnley River crossing on track N from Beverley Springs.	-16.05	125.4	KY418699	-	-
<i>D. reclinata</i>	Cowie 4516	NT: Nhulunbuy.	-12.16	135.76	KY418702	-	-
<i>D. retrorsa</i>	Crisp 9331	WA: 1 km N of Hopetoun P.O.	-33.942	120.125	KY418703	-	KY426224
<i>D. rhizomata</i>	Crisp 9688	WA: E of Hyden–Lake King road.	-32.820	119.719	KY418705	KY418806	-
<i>D. rhizomata</i>	Crisp 9363	WA: 6.0 km along Holt Rock–Kulin Road from intersection with Holt Rock South Road.	-32.701	119.334	KY418704	-	-
<i>D. rhombifolia</i>	Crisp 8913	WA: 1.5 km W of Cuballing.	-32.828	117.168	AY233121	-	KY426225
<i>D. rubiginosa</i>	Crisp 9001	WA: Holt Rock.	-32.683	119.415	AY233122	KY418807	KY426226
<i>D. sarissa</i> subsp. <i>sarissa</i>	Crisp 9185	WA: 15.5 km E from Newdegate along road to Lake King.	-33.097	119.181	KY418706	KY418808	KY426227
<i>D. scabrella</i>	Crisp 11358	WA: near Condingup.	-33.6	122.9	KY418707	-	KY426228
<i>D. schwarzenegger</i>	Wrigley 71/213 (CBG 43516)	NSW: W of West Wyalong.	-33.9	147.0	KY418711	-	KY426231
<i>D. schwarzenegger</i>	Beaglehole 69324	Vic.: near Wychitella.	-36.3	143.4	KY418710	-	-
<i>D. schwarzenegger</i>	Crisp 9425	SA: N of Jamestown.	-33.0	138.6	KY418708	KY418809	KY426229
<i>D. schwarzenegger</i>	Crisp 9558	Vic.: W of Rushworth.	-36.6	145.0	KY418709	KY418810	KY426230
<i>D. scoparia</i>	Crisp 9355	WA: 50.3 km S from Pingrup towards Borden.	-33.891	118.363	KY418712	-	-

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Appendix I. (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. scoparia</i>	<i>Crisp 9433</i>	WA: 11.7 km E from Corrigin along road to Kondinin.	-33.414	117.942	KY418713	KY418811	KY426232
<i>D. sejugata</i>	<i>Burns 46</i>	Tas.: ca. 6 km W of Mole Creek.	-41.53	146.33	KY418714	KY418812	KY426233
<i>D. smithiorum</i>	<i>Crisp 9029</i>	WA: near Minnivale.	-31.2	117.2	AY233123	-	-
<i>D. smithiorum</i>	<i>Crisp 9385</i>	WA: near Minnivale.	-31.2	117.2	KY418715	KY418813	KY426234
<i>D. smithiorum</i>	<i>Crisp 9386</i>	WA: near Minnivale.	-31.2	117.2	KY418716	-	-
<i>D. speciosa</i>	<i>Crisp 9017</i>	WA: Eneabba area.	-29.8	115.5	AY233124	KY418814	KY426235
<i>D. spinosissima</i>	<i>Crisp 9342</i>	WA: 2.3 km off Albany Highway along Millstream Road.	-34.848	117.772	KY418717	KY418815	KY426236
<i>D. spiralis</i>	<i>Crisp 9024</i>	WA: Wongan Hills area.	-30.9	116.7	AY233125	-	KY426237
<i>D. spiralis</i>	<i>Crisp 9382</i>	WA: Wongan Hills area.	-30.9	116.7	KY418718	-	-
<i>D. squarrosa</i>	<i>Crisp 9127</i>	NSW: Between Appin township and Appin Colliery.	-34.210	150.794	KY418719	KY418816	KY426238
<i>D. stricta</i>	<i>Crisp 9305</i>	SA: Wilpena Pound.	-31.5	138.6	KY418720	KY418817	KY426239
<i>D. striata</i>	<i>Crisp 9332</i>	WA: 14.8 km along Hamersley Drive from Hopetoun–Ravensthorpe Road.	-33.933	119.987	KY418721	KY418818	KY426240
<i>D. suaveolens</i>	<i>Crisp 9155</i>	NSW: Monga State Forest, Milo Road.	-35.642	149.891	KY418722	KY418819	KY426241
<i>D. subulata</i>	<i>Crisp 9381</i>	WA: 40 km from Morawa along road to Mullewa.	-28.904	115.83	KY418723	-	KY426242
<i>D. teretifolia</i>	<i>Crisp 8987</i>	WA: Mt Desmond, S slopes.	-33.619	120.157	AY233126	KY418820	KY426243
<i>D. teretifolia</i>	<i>Crisp 9430</i>	WA: 132 km S along Balladonia Road towards Mt Ragged.	-33.468	123.438	KY418724	KY418821	KY426244
<i>D. tortuosa</i>	<i>Crisp 9359</i>	WA: near Lake Grace.	-33.1	118.2	KY418725	KY418822	KY426245
<i>D. triflora</i>	<i>Crisp 9375</i>	WA: 5.7 km from Marchagee along road to Coorow.	-30.003	116.091	KY418726	KY418823	KY426246
<i>D. trigonophylla</i>	<i>Crisp 9337</i>	WA: Stirling Range, 13 km E along E Pillenorup Track from Chester Pass Road.	-34.428	118.204	-	-	KY426247
<i>D. trigonophylla</i>	<i>Crisp 9446</i>	WA: Stirling Range, 13 km E along E Pillenorup Track from Chester Pass Road.	-34.428	118.204	KY418727	-	-
<i>D. ulicifolia</i> subsp. <i>aridicola</i>	<i>Crisp 9310</i>	SA: Eyre Peninsula, ca. 27.5 km due N of Cowell.	-33.44	136.921	KY418728	KY418824	KY426248
<i>D. ulicifolia</i> subsp. <i>incarnata</i>	<i>Crisp 9405</i>	SA: Mt Lofty, 400 m SW of summit.	-34.976	138.705	KY418729	KY418825	KY426249

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**Appendix I.** (Continued)

Taxon name	Collector & number	Locality			GenBank accession numbers		
		Description	Latitude	Longitude	ITS	ndhF	trnL–trnF
<i>D. ulicifolia</i> subsp. <i>pilligensis</i>	Crisp 11677	Qld: ca. 37 km W of Milmerran.	-27.888	150.896	KY418730	-	-
<i>D. ulicifolia</i> subsp. <i>ruscifolia</i>	Crisp 9149	NSW: Brindabella Range, Mt Franklin Road, 4.8 km S of Piccadilly Circus.	-35.393	148.794	AY233127	KY418826	KY426250
<i>D. ulicifolia</i> subsp. <i>stenophylla</i>	Crisp 9117	NSW: Putty Road, 5 km from Colo Heights towards Windsor.	-33.406	150.78	AY233128	KY418827	KY426251
<i>D. ulicifolia</i> subsp. <i>ulicifolia</i>	Crisp 9115	NSW: Mahon's Creek, ca. 9 km from central Richmond along road to Springwood.	-33.629	150.671	AF518100	KY418828	AF518132
<i>D. umbellulata</i>	Crisp 11693	NSW: Torrington State Conservatio Area; Blatherarm Creek campground vicinity.	-29.241	151.709	KY418732	-	-
<i>D. umbellulata</i>	Crisp 9302	NSW: Palm Beach, Sydney.	-33.58	151.31	KY418731	KY418829	KY426252
<i>D. uncinata</i>	Crisp 9004	WA: W of Corrigin.	-32.3	117.8	-	-	KY426253
<i>D. uniflora</i>	Crisp 9362	WA: 20.5 km E of Newdegate along road to Lake King.	-33.097	119.232	KY418733	KY418830	KY426254
<i>D. villifera</i>	Crisp 9617	Qld: Cania Gorge National Park, Giants Chair lookout.	-24.722	150.984	-	KY418831	KY426255
<i>D. wyattiana</i>	Crisp 9160	NSW: 22.8 km N of Kings Hwy and 2.1 km N of Bimberamala River crossing.	-35.456	150.092	AY233129	KY418832	KY426256

## Appendix II. Alphabetical List of Taxa.

Numerical position in sequence of treatments is indicated in parenthesis.

*Daviesia abnormis* (39)  
*Daviesia acicularis* (5)  
*Daviesia alata* (43)  
*Daviesia alternifolia* (21)  
*Daviesia anceps* (1)  
*Daviesia angulata* (123)  
*Daviesia aphylla* (74)  
*Daviesia apiculata* (115)  
*Daviesia arborea* (54)  
*Daviesia argillacea* (67)  
*Daviesia arenaria* (8)  
*Daviesia arthropoda* (4)  
*Daviesia articulata* (76)  
*Daviesia asperula* (63)  
*Daviesia asperula* subsp. *asperula* (63a)  
*Daviesia asperula* subsp. *obliqua* (63b)

*Daviesia audax* (30)  
*Daviesia benthamii* (72)  
*Daviesia brachyphylla* (107)  
*Daviesia brevifolia* (106)  
*Daviesia bursarioides* (12)  
*Daviesia buxifolia* (47)  
*Daviesia campephylla* (75)  
*Daviesia cardiophylla* (35)  
*Daviesia chapmanii* (127)  
*Daviesia cordata* (23)  
*Daviesia corymbosa* (44)  
*Daviesia costata* (18)  
*Daviesia crassa* (128)  
*Daviesia crenulata* (24)  
*Daviesia croniniana* (26)  
*Daviesia cunderdin* (37)  
*Daviesia daphnoides* (103)  
*Daviesia debilior* (87)  
*Daviesia debilior* subsp. *debilior* (87a)  
*Daviesia debilior* subsp. *sinuans* (87b)  
*Daviesia decipiens* (99)  
*Daviesia decurrens* (95)  
*Daviesia decurrens* subsp. *decurrens* (95a)  
*Daviesia decurrens* subsp. *hamata* (95b)  
*Daviesia devito* (79)  
*Daviesia dielsii* (121)  
*Daviesia dilatata* (101)  
*Daviesia discolor* (55)  
*Daviesia divaricata* (14)  
*Daviesia divaricata* subsp. *divaricata* (14a)  
*Daviesia divaricata* subsp. *lanulosa* (14b)  
*Daviesia elliptica* (50)  
*Daviesia elongata* (20)  
*Daviesia emarginata* (104)  
*Daviesia epiphyllum* (84)  
*Daviesia eremaea* (66)  
*Daviesia euphorbioides* (130)  
*Daviesia euryloba* (38)  
*Daviesia filipes* (59)  
*Daviesia filipes* subsp. *filipes* (59a)  
*Daviesia filipes* subsp. *terminalis* (59b)  
*Daviesia flava* (45)  
*Daviesia flexuosa* (98)  
*Daviesia genistifolia* (78)  
*Daviesia glossosema* (111)  
*Daviesia gracilis* (88)  
*Daviesia grahamii* (41)  
*Daviesia grossa* (117)  
*Daviesia hakeoides* (91)  
*Daviesia hakeoides* subsp. *hakeoides* (91a)  
*Daviesia hakeoides* subsp. *subnuda* (91b)  
*Daviesia horrida* (80)

*Daviesia implexa* (19)  
*Daviesia incrassata* (108)  
*Daviesia incrassata* subsp. *incrassata* (108a)  
*Daviesia incrassata* subsp. *reversifolia* (108b)  
*Daviesia incrassata* subsp. *teres* (108c)  
*Daviesia inflata* (110)  
*Daviesia intricata* (96)  
*Daviesia intricata* subsp. *intricata* (96a)  
*Daviesia intricata* subsp. *xiphophylla* (96b)  
*Daviesia laevis* (53)  
*Daviesia lancifolia* (31)  
*Daviesia latifolia* (51)  
*Daviesia laxiflora* (52)  
*Daviesia leptophylla* (49)  
*Daviesia lineata* (27)  
*Daviesia localis* (15)  
*Daviesia longifolia* (16)  
*Daviesia major* (86)  
*Daviesia megacalyx* (81)  
*Daviesia mesophylla* (118)  
*Daviesia microphylla* (119)  
*Daviesia microcarpa* (3)  
*Daviesia mimosoides* (48)  
*Daviesia mimosoides* subsp. *acris* (48b)  
*Daviesia mimosoides* subsp. *mimosoides* (48a)  
*Daviesia mollis* (32)  
*Daviesia nematophylla* (69)  
*Daviesia newbeyi* (42)  
*Daviesia nova-anglica* (61)  
*Daviesia nudiflora* (40)  
*Daviesia nudiflora* subsp. *amplectens* (40b)  
*Daviesia nudiflora* subsp. *drummondii* (40c)  
*Daviesia nudiflora* subsp. *hirtella* (40d)  
*Daviesia nudiflora* subsp. *nudiflora* (40a)  
*Daviesia obovata* (82)  
*Daviesia oppositifolia* (22)  
*Daviesia ovata* (25)  
*Daviesia oxyclada* (120)  
*Daviesia oxylobium* (64)  
*Daviesia pachyloma* (2)  
*Daviesia pachyphylla* (129)  
*Daviesia pauciflora* (17)  
*Daviesia pectinata* (65)  
*Daviesia pedunculata* (29)  
*Daviesia physodes* (109)  
*Daviesia pleurophylla* (13)  
*Daviesia podophylla* (112)  
*Daviesia polyphylla* (122)  
*Daviesia preissii* (124)  
*Daviesia pseudaphylla* (90)  
*Daviesia pubigera* (60)  
*Daviesia pteroclada* (93)



*Daviesia purpurascens* (71)  
*Daviesia quadrilatera* (113)  
*Daviesia quoquoversus* (58)  
*Daviesia ramosissima* (114)  
*Daviesia reclinata* (11)  
*Daviesia retrorsa* (97)  
*Daviesia rhizomata* (131)  
*Daviesia rhombifolia* (28)  
*Daviesia rubiginosa* (83)  
*Daviesia sarissa* (94)  
*Daviesia sarissa* subsp. *redacta* (94b)  
*Daviesia sarissa* subsp. *sarissa* (94a)  
*Daviesia scabrella* (77)  
*Daviesia schwarzenegger* (73)  
*Daviesia scoparia* (68)  
*Daviesia sejugata* (9)  
*Daviesia smithiorum* (92)  
*Daviesia speciosa* (85)  
*Daviesia spinosissima* (125)  
*Daviesia spiralis* (33)  
*Daviesia squarrosa* (56)  
*Daviesia striata* (126)  
*Daviesia stricta* (6)  
*Daviesia suaveolens* (46)  
*Daviesia subulata* (70)  
*Daviesia teretifolia* (116)  
*Daviesia tortuosa* (105)  
*Daviesia triflora* (89)  
*Daviesia trigonophylla* (100)  
*Daviesia ulicifolia* (10)  
*Daviesia ulicifolia* subsp. *aridicola* (10e)  
*Daviesia ulicifolia* subsp. *incarnata* (10f)  
*Daviesia ulicifolia* subsp. *pilligensis* (10d)  
*Daviesia ulicifolia* subsp. *ruscifolia* (10c)  
*Daviesia ulicifolia* subsp. *stenophylla* (10b)  
*Daviesia ulicifolia* subsp. *ulicifolia* (10a)  
*Daviesia umbellulata* (62)  
*Daviesia umbonata* (36)  
*Daviesia uncinata* (102)  
*Daviesia uniflora* (34)  
*Daviesia villifera* (57)  
*Daviesia wyattiana* (7)

### Appendix III. Synonyms and Excluded Taxa.

This list includes synonyms of recognised names within *Daviesia*, as well as names that have been transferred from *Daviesia* to another genus, or for which no type specimen is available, or the type is insufficient for identification, or the type host institution is unknown. Where possible, names are referred to the correct name for the taxon.

*Daviesia acanthoclada* Turczaninow (1853: 262) = *Hovea acanthoclada* (Turcz.) Mueller (1863: 15).  
*Daviesia acanthoclona* F.Muell. = 74. *D. aphylla*.

*Daviesia adnata* F.Muell. = 126. *D. striata*.  
*Daviesia alternifolia* Endl. var. *ternata* (Endl.) E.Pritz. = 21. *D. alternifolia*.  
*Daviesia arborea* F.Muell. & Scortech. ex Scortech. = 54. *D. arborea*.  
*Daviesia benthamii* subsp. *acanthoclona* (F.Muell.) Crisp = 74. *D. aphylla*.  
*Daviesia brevifolia* Lindl. var. *ephedroides* Benth. = 74. *D. aphylla*.  
*Daviesia calystegia* Turcz. = 24. *D. crenulata*.  
*Daviesia chordophylla* Meisn. = 16. *D. longifolia*.  
*Daviesia colletioides* A.Cunn. ex Benth. = 78. *D. genistifolia*.  
*Daviesia colletioides* auct. non A.Cunn. ex Benth. = 110. *D. inflata* (partly) and = 108a. *D. incrassata* subsp. *incrassata* (partly).  
*Daviesia coluteoides* A.Cunn. ex Walp. = 78. *D. genistifolia*.  
*Daviesia concinna* R.Br. ex Benth. = 62. *D. umbellulata*.  
*Daviesia condensata* Turczaninow (1853: 265) = *Dillwynia pungens* (Sweet) A.H.Mackay ex Loddiges (1829: 1502).  
*Daviesia corymbosa* Sm. var. *arborea* (W.Hill) Maiden = 54. *D. arborea*.  
*Daviesia corymbosa* Sm. var. *arborea* auct. non (W.Hill) Maiden = 52. *D. laxiflora*.  
*Daviesia corymbosa* Sm. var. *laxiflora* J.H.Willis = 52. *D. laxiflora*.  
*Daviesia corymbosa* Sm. var. *linearis* (Lodd.) R. Baker, see *D. linearis* Lodd.  
*Daviesia corymbosa* Sm. var. *mimosoides* (R.Br.) Benth. = 48. *D. mimosoides*.  
*Daviesia corymbosa* Sm. var. *stjohnii* F. Barnard = 49. *D. leptophylla*.  
*Daviesia corymbosa* Sm. var. *virgata* (A.Cunn. ex Hooker) Ewart = 49. *D. leptophylla*.  
*Daviesia denudata* Ventenat (1803a: 6) = *Viminaria juncea* (Schrader & Wendland 1795: 9) Hoffmannsegg (1824: 120, 200).  
*Daviesia drummondii* Meisn. = 40c. *D. nudiflora* subsp. *drummondii*.  
*Daviesia egena* Mueller (1855: 39) = *Templetonia egena* (F.Muell.) Bentham (1864: 170).  
*Daviesia epiphylla* auct. non Meisn. See 84. *D. epiphyllum*.  
*Daviesia ericoides* (Ventenat 1803b: 35) Persoon (1805: 454) = *Aotus ericoides* (Vent.) Don (1832: 120)  
*Daviesia falcata* Heynhold (1846: 193), *nom. nud.*  
*Daviesia frazeri* Heynhold (1846: 193), *nom. nud.*  
*Daviesia genistifolia* A.Cunn. ex Benth. var. *colletioides* (A.Cunn. ex Benth.) Benth. = 78. *D. genistifolia*.  
*Daviesia genistoides* Lodd. = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia glauca* Lodd. = 48a. *D. mimosoides*.  
*Daviesia hakeoides* Meisn. var. *major* Benth. = 86. *D. major*.  
*Daviesia hakeoides* Meisn. var. *subnuda* Benth. = 91b. *D. hakeoides* subsp. *subnuda*.  
*Daviesia hakeoides* Meisn. f. *gracilentata* Meisn. = 91a. *D. hakeoides* subsp. *hakeoides*.  
*Daviesia hakeoides* Meisn. f. *intermedia* Meisn. = 91a. *D. hakeoides* subsp. *hakeoides*.  
*Daviesia hakeoides* Meisn. f. *robusta* Meisn. = 91a. *D. hakeoides* subsp. *hakeoides*.  
*Daviesia humifusa* Sieber ex Candolle (1825: 103), *nom. inval.*, given as a synonym of *Podolobium scandens* (Smith 1805: 506) Candolle (1825: 103) var. *humifusum* Candolle (1825: 103) = *P. scandens* (Sm.) DC.  
*Daviesia incrassata* auct. non Sm. = 119. *D. microphylla*.  
*Daviesia incrassata* Sm. var. *benthamii* (Meisn.) Domin = 72. *D. benthamii*.  
*Daviesia incrassata* Sm. var. *brachyphylla* (Meisn.) Domin = 107. *D. brachyphylla*.  
*Daviesia incrassata* Sm. var. *cylindrica* Domin = 110. *D. inflata*.  
*Daviesia incrassata* Sm. var. *dorrienii* Domin = 108a. *D. incrassata* subsp. *incrassata*.  
*Daviesia incrassata* Sm. var. *typica* Domin = 108a. *D. incrassata* subsp. *incrassata*.  
*Daviesia intermedia* Heynhold (1846: 193), *nom. nud.*  
*Daviesia juncea* (Schrader & Wendland 1795: 9) Persoon (1805: 454) = *Viminaria juncea* (Schrader.) Hoffmannsegg (1824: 120, 200).  
*Daviesia juncea* Sm. = 88. *D. gracilis*.  
*Daviesia juncea* Sm. var. *spinescens* S.Moore = 91b. *D. hakeoides* subsp. *subnuda*.  
*Daviesia juniperina* Loddiges (1826: 22), *nom. nud.*  
*Daviesia latifolia* R.Br. var. *buxifolia* (Benth.) C.Moore & Betche = 47. *D. buxifolia*.

*Daviesia latifolia* R.Br. var. *lanceolata* Regel = 52. *D. latifolia*.  
*Daviesia latifolia* R.Br. var. *parvifolia* Benth. = 50. *D. elliptica*.  
*Daviesia latipes* F.Muell. = 65. *D. pectinata*.  
*Daviesia laurifolia* Link = 48a. *D. mimosoides* subsp. *mimosoides*.  
*Daviesia linearis* Loddiges (1830b: 1615), *nom. nud.* *Daviesia corymbosa* Sm. var. *linearis* (Lodd.) Baker (1896: 438).  
*Daviesia longipes* Domin = 59. *D. filipes*.  
*Daviesia macrophylla* Endl. = 44. *D. corymbosa*.  
*Daviesia mimosoides* R.Br. var. *laxiflora* (J.H. Willis) J.H. Willis = 52. *D. laxiflora*.  
*Daviesia mimosoides* R.Br. ['Dryand.'] var. *saligna* Regel (1856: 39). Type specimen unknown and the description is too brief to allow application of this name.  
*Daviesia mollis* Turcz. var. *minor* Benth. = 31. *D. lancifolia*.  
*Daviesia nudiflora* Meisn. var. *lanceolata* Benth. = 40c. *D. nudiflora* subsp. *drummondii*.  
*Daviesia nudula* J.Black = 74. *D. aphylla*.  
*Daviesia obtusifolia* F.Muell. = 104. *D. emarginata*.  
*Daviesia obtusifolia* F.Muell. var. *parvifolia* E.Pritz. = 67. *D. argillacea*.  
*Daviesia pachyloma* Turcz., typographical error. See 2. *D. pachyloma*.  
*Daviesia pachylina* auct. non Turcz., orthographical variant. See 2. *D. pachyloma*.  
*Daviesia paniculata* Benth. = 14. *D. divaricata*.  
*Daviesia parifolia* F.Muell. = 24. *D. crenulata*.  
*Daviesia parvifolia* S.Moore = 119. *D. microphylla*.  
*Daviesia pectinata* Lindl. var. *decipiens* E.Pritz. = 99. *D. decipiens*.  
*Daviesia pectinata* Lindl. var. *prionodes* (Meisn.) E.Pritz. = 95a. *D. decurrens* subsp. *decurrens*.  
*Daviesia pedunculata* Benth. in Lindl. var. *minor* Meisn. = 31. *D. lancifolia*.  
*Daviesia phyllodinea* S.Moore = 41. *D. grahamii*.  
*Daviesia phyllodinea* S.Moore var. *parvifolia* S.Moore = 67. *D. argillacea*.  
*Daviesia physodes* A.Cunn. ex G.Don f. *gracilis* Meisn. = 95a. *D. decurrens* subsp. *decurrens*.  
*Daviesia prionodes* Meisn. = 95a. *D. decurrens* subsp. *decurrens*.  
*Daviesia pungens* J.Mackay ex Courtois (1833: 250). Type: unknown. Notes: We have not seen the original publication, which is very obscure, and as no type is known, the application of this name is undetermined.  
*Daviesia pungens* J.Sinclair in Donn (1831: 187), *nom. nud.*  
*Daviesia pungens* A.Cunn. ex Benth. = 5. *D. acicularis*.  
*Daviesia racemulosa* DC. = 62. *D. umbellulata*.  
*Daviesia ramulosa* Benth. in Lindley (1839: xiv) = *Mirbelia ramulosa* (Benth. in Lindl.) Gardner (1930: 57).  
*Daviesia recurvata* Maiden & R.T.Baker = 60. *D. pubigera*.  
*Daviesia reticulata* Smith (1808b: 256) = *Pultenaea reticulata* (Sm.) Bentham (1864: 119).  
*Daviesia reversifolia* F.Muell. = 108. *D. incrassata* subsp. *reversifolia*.  
*Daviesia ruscifolia* A.Cunn. ex Benth. = 10c. *D. ulicifolia* subsp. *ruscifolia*.  
*Daviesia saligna* Steudel (1840: 1233), *nom. nud.*  
*Daviesia squarrosa* Sm., var. *villifera* (A.Cunn. ex Benth.) Benth. = 57. *D. villifera*.  
*Daviesia ternata* Endl. = 21. *D. alternifolia*.  
*Daviesia ulicina* Sm. ex Donn = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia ulicina* Sm. = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia ulicina* Sm. var. *angustifolia* F.M.Bailey & Tenison-Woods = 10b. *D. ulicifolia* subsp. *stenophylla*.  
*Daviesia ulicina* Sm. var. *angustifolia* F.M.Bailey = 10b. *D. ulicifolia* subsp. *stenophylla*.  
*Daviesia ulicina* Sm. var. *communis* (Benth.) Maiden & Betche = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia ulicina* Sm. var. *ruscifolia* auct. non (A.Cunn. ex Benth.) J.M.Black = 8. *D. arenaria*.  
*Daviesia ulicina* Sm. var. *ruscifolia* (A.Cunn. ex Benth.) J.M.Black = 10c. *D. ulicifolia* subsp. *ruscifolia*.  
*Daviesia ulicina* Sm. var. *subumbellata* (Benth.) Ewart = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia ulicina* Sm. var. *umbellulata* (Sm.) Wawra = 62. *D. umbellulata*.  
*Daviesia ulicina* Sm. f. *angustifolia* Benth. = 10b. *D. ulicifolia* subsp. *stenophylla*.  
*Daviesia ulicina* Sm. f. *communis* Benth. = 10a. *D. ulicifolia* subsp. *ulicifolia*.

*Daviesia ulicina* Sm. f. *ruscifolia* (A.Cunn. ex Benth.) Benth. = 10c. *D. ulicifolia* subsp. *ruscifolia*.  
*Daviesia ulicina* Sm. f. *subumbellata* Benth. = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia umbellata* Labill., misspelled and misapplied name = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia umbellata* Sieber ex Candolle (1825: 103) = *Podolobium scandens* (Smith 1805: 506) Candolle (1825: 103). See Crisp & Weston (1995: 281).  
*Daviesia umbellulata* auct. non Sm. = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia umbellulata* auct. non Sm. var. *acuminata* J.D.Hooker = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia umbellulata* auct. non Sm. var. *angustifolia* DC. = 10a. *D. ulicifolia* subsp. *ulicifolia*.  
*Daviesia umbellulata* Sm. var. *dietrichiae* Domin = 62. *D. umbellulata*.  
*Daviesia umbellulata* Sm. var. *pubigera* (A.Cunn. ex Benth.) Benth. = 60. *D. pubigera*.  
*Daviesia virgata* A.Cunn. ex Hooker = 49. *D. leptophylla*.