

Grevillea manglesii (Proteaceae: Grevilleoideae: Hakeinae) revisited

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Abstract

The correct citation for *Grevillea manglesii* (Proteaceae) is *G. manglesii* Pépin (1838). A neotype is here selected from among historic collections, now at Paris (P). Should the minimal description provided by Pépin be successfully challenged as inadequate, the name would not change but the revised authority would be *Grevillea manglesii* (Graham) A.Baumann and N.Baumann (1843). The origins and complex taxonomic and horticultural history of *G. manglesii* and its synonyms *Manglesia glabrata* Lindl., *Anadenia manglesii* Graham, *Grevillea manglesii* Hort., *Manglesia trilobata* Hort. ex Ettingsh., and *Manglesia cuneata* Endl. are outlined and discussed, together with new insights discerned from James Mangles' unpublished Letter Books. The important role of Captain James Mangles R.N. to the botany and horticulture of *Grevillea manglesii* is reviewed and historical errors are corrected. *Manglesia glabrata* Lindl. is lectotypified. *G. ornithopoda* Meisn. is reinstated at specific rank and *G. dissectifolia* (McGill.) Olde is published as a new combination. Both are phenetically diagnosable without intergrades and occur in discrete populations that sometimes overlap the distribution of related species.

Introduction

In May 1839, Stephan L. Endlicher (1839: 25) erected the genus *Manglesia*, in which he described two species, *Manglesia tridentifera* Endl. and *M. vestita* Endl. Endlicher not only named his new genus after the English horticulturist brothers, James and Robert Mangles, but acknowledged them as the source of numerous plants from south-west 'New Holland' that 'already adorn our gardens'. From 1840, Endlicher was the director of the Botanic Garden at Vienna (*Hortus Botanicus Vindobonensis*) and was also Professor of Botany at the University of Vienna to which the Botanic Garden was attached (Rompel 1913). In the years leading up to his important academic appointments, Endlicher (1837, 1838, 1839) described many species of Australian Flora, using both the dried gatherings of various collectors and living plants in cultivation, of which the most important was probably Baron Karl von Hügel (1795–1870). Von Hügel had not only collected specimens and seeds in Western Australia between 1833–1834 but maintained a large garden at Hietzing, near Vienna, Austria, famous for its beauty and variety of cultivated plants. There he not only grew many species of Australian plants from mainly imported seeds between 1824–1848 (Lindley 1839–40, Peintner 1841, Loudon 1842) but he also exported live plants over large parts of Europe (Jacques 1843, Planchon 1858). '*Colitur in horto Hügeliano*' [It is cultivated in von Hügel's garden] is a familiar sentence in many of Endlicher's species' treatments of Australian plants.

In his discussion of the genus *Manglesia*, Endlicher (1839: 25) also mentioned a third species, *Manglesia cuneata* Endl., to which he referred *Grevillea manglesii* ‘Hortul.’ as a synonym. (The term ‘Hortul.’ or ‘Hort.’ is an abbreviation of the Latin *hortulanorum*, of gardeners, used with epithets given by horticulturists, often to plants that have not been formally described). Although Endlicher referred to *Manglesia cuneata* as if it had already been published, no earlier description has been found. The name came into accepted use, particularly in Central Europe, and there are two undated specimens of *G. manglesii* (P750707, P750708) ex *Hort. Bot. Vindobonensis* labelled *Manglesia cuneata* Endlicher that serve to remind us of the acceptance of this name at the time and for several decades later (e.g. Ettingshausen 1858: 255). However, as McGillivray and Makinson (1993: 428) pointed out, ‘the diagnostic and descriptive data included in the same paragraph as the name *Manglesia cuneata* serve only to distinguish the genus *Manglesia* from other taxa.’ Endlicher (1842a: 287) later asserted the priority of *Manglesia cuneata* over *M. glabrata* in a catalogue of the plants growing in the *Hortus Vindobonensis* but again there failed to distinguish it. Thus, *Manglesia cuneata* is affirmed as *nomen nudum* and the subsequent proposal by Druce (1917: 625) to cite it as the basionym of the supposed combination *Grevillea cuneata* (Endl.) Druce is also a *nomen nudum* and equally insupportable. In any case the combination *Grevillea cuneata* was occupied by that time because Jacques (1843: 191) had validly published the name in reference to a related species with pubescent branches and leaves, probably *Grevillea vestita* (Endl.) Meisn., and without citing Endlicher’s name as basionym. *Grevillea cuneata* Jacques is one of seven species or varieties of shrubs, originally from New Holland, sent from Vienna by von Hügel to the residence of M. Martine, a flower gardener, Rue des Bourguignons, Paris. The application of Jacques’ name is uncertain in the absence of a cited type but it certainly does not apply to *Manglesia cuneata* Endl., a glabrous shrub cited by Endlicher with *G. manglesii* Hort. as synonym.

It is not stated in Endlicher’s 1839 work where specimens of *Grevillea manglesii* Hort. were consulted or collected but the *Hortus Botanicus Vindobonensis* at Vienna, noted as a place of its cultivation only a few years later by Endlicher (1842a), would be a reasonable starting point. Endlicher might also have seen it in the garden of von Hügel at Hietzing. *Grevillea manglesii* was among the Australian plants relocated to the glass-houses of Prince Anatole de Démidoff at San Donato near Firenze (Florence) by von Hügel between 1853 and 1856 (Planchon 1858: viii). At Schönbrunn Palace, home of the Habsburgs, an important collection of Australian plants was also being accumulated and it was there that Ettingshausen (1858) illustrated and described *Manglesia trilobata* Hort. ex Ettingsh., likely conspecific with *G. manglesii* (fide Olde 2017: 310). The nurserymen S. and J. Rinz (1838: 27) of Frankfurt also listed ‘*Grevillea Manglesii*’ for sale at 12 fl. per plant. Almost certainly, the plant came originally from England, where it had been raised from seed, and where, from 1837, it was known by the same name, *Grevillea manglesii* Hort. (Graham 1839).

In June 1839, Robert Graham (1839: 189) formally described a plant, sent to him as *Grevillea manglesii* Hort., using a cultivated plant flowering in Edinburgh Botanic Garden, Scotland, naming it *Anadenia manglesii*. Robert Brown, at that time the leading Proteaceae taxonomist, would have strongly disapproved, having already written (1830: 21) that, as with *Grevillea anethifolia*, the presence of a semi-annular hypogynous gland [or nectary] required its inclusion in *Grevillea*, ‘as one diverse genus’. Graham noted that it had been sent to him by the nurseryman Mr. Lowe [sic] of the Clapton Nursery, in 1837, ‘under the name of *Grevillea manglesii*’. It seems likely that Low had bestowed the specific epithet in honour of one of the Mangles brothers, reflecting perhaps also the source of his plants. W.J. Hooker (1841) published an illustrated treatment of Graham’s *Anadenia manglesii*, repeating Graham’s diagnosis, with slight modifications, and a much abbreviated portion of the protologue. For many years, indeed until relatively recently, it was mistakenly thought that Graham’s description was first published in Hooker’s work, leading to a misunderstanding about the original date of Graham’s publication and consequent errors in nomenclatural priority and correct authority. McGillivray and Makinson (1993: 427) even considered (but did not cite) Hooker’s plate as a suitable type, no doubt because the treatment by Graham in Hooker was also thought by them, and indeed even by Meisner (1845: 549), to be the first. However, Hooker’s illustration was based on a specimen of unknown type status in his own herbarium, according to the title page (Hooker 1841) and not the plant growing in Scotland.

As early as 1838, even before the genus *Manglesia* had been published, John Lindley (1799–1865), a leading English botanist, became aware of Endlicher’s intention. The information probably came from correspondence with Endlicher (now lost, see Riedl-Dorn 2019) or possibly from Robert Brown or George Bentham with whom Endlicher is known to have corresponded (Rompel 1913). After borrowing specimens from his friend Captain James Mangles R.N.(*q.v.*) which had been sent by James Drummond (*q.v.*) and others, Lindley (1838c) wrote in part ‘The Swan River collection is much more interesting than the other and contains many things quite new to me. I want to find among them something good enough to be created a *Manglesia* and no doubt I shall succeed; it would be my frontispiece’. On 15 September, Lindley (1838d) again wrote to Mangles ‘There are many new genera, as you will see; but I do not find one quite so pretty as I could wish for *Manglesia*. This however we shall be able to settle by and by. In the meanwhile I am anxious for materials as I am bent upon

publishing ‘A view of the botany of the Swan River Colony’. It is clear from these two extracts that none of the Drummond specimens that Lindley had seen up until then was suitable for description as *Manglesia*. The collections of James Drummond, to which Lindley referred, comprised a specimen book ‘choke full’ of pressed plants attached to numbered pages, and about 60 (?100) unnumbered specimens of Proteaceae in a separate parcel sent via the *Hero* (Drummond 1837, 1838). We can also gather from this correspondence that, at that time, Lindley was unaware of the horticultural presence in England of *Grevillea manglesii* Hort., or if he was, did not recognise its connection to *Manglesia*.

However, around 5000 unsorted Drummond specimens capable of division into 10 sets of 500, which had mainly been collected in 1837 (Drummond 1839, Erickson 1969: 35–6) and sent in November 1838, arriving at Margate from Australia in the *Joshua Carroll* on 21 April 1839 (Lemson 2015), changed all that. The *Joshua Carroll* also carried the first consignment of specimens from Georgiana Molloy (1805–1843), a consignment of live plants from near Perth, packed by Captain Richard Goldsmith Meares (1780–1862) and seeds from Lady Ellen Stirling (Lady Stirling 1839). Drummond (1838a) also sent £15 worth of seeds to Low on the *Joshua Carroll* in response to an order sent in 1837 (Drummond 1837). The value of this order in today’s currency would be AUD\$2500–4000. By 2 July 1841, trade between Low and Drummond had expanded to the degree that an agreement to supply seeds and bulbs was entered ‘to a certain annual amount’ (Drummond 1842b: 215).

The specimens and plant cargo were consigned to Captain James Mangles R.N. but soon ended up in Lindley’s hands. Mangles had originally agreed to handle Drummond’s specimens and to aid his attempts to find buyers for them, so that he (Drummond) could spend his whole time in the bush collecting natural history specimens, including plants and insects. For a number of reasons outlined by Erickson (1969) Mangles soon backed away from this agreement. In addition, Mangles (1839: 7) stated that he was ‘totally ignorant of botany’ apart from which he was not enjoying good health at this time, suffering from ‘a protracted illness, accompanied with intervals of fluctuating debility and lowness of spirits’.

Lindley (1840b) requested George Bentham to divide Drummond’s specimens from the *Joshua Carroll* into sets and to begin the task of finding and distributing them to potential buyers. ‘I wish to present Mr [Robert] Brown with a full collection to be placed in the Linnaean Herbarium or rather the Herbarium of the Linnean Society. I send you specimens of upwards of 100 Proteaceae, about 50 Orchidea and about 30 Stylidium’s’ (Drummond 1838a). Brown received at least some of his specimens in July 1839 (see *Manglesia glabrata*, list of isolectotypes, below). Lindley also secured for himself the free right to one of the sets (Drummond 1836), most of which are now in Lindley’s herbarium at CGE (Gardiner 2018). Another party interested in Drummond’s specimens and correspondence was William Jackson Hooker (1785–1865), soon to be appointed the first full-time director of Kew, who wrote to Drummond in 1839 asking him specifically to make collections for him, a request fulfilled initially in 1842, from which time Drummond’s First Collection and numbering *sensu* Hooker dates. These collections subsequently also got confused until they were sorted by Mr Richard Kippist (1812–1882), librarian of the Linnean Society (Meisner 1852: 181).

In the third part of *A sketch of the vegetation of the Swan River Colony*, Lindley (1840a: xxxvii n.183) published the name *Manglesia glabrata*, noting there his support for Endlicher’s generic concept (see Olde 2020) but not linking the name with any synonyms. In none of the correspondence or published literature seen is there any evidence that Lindley was aware of *Grevillea manglesii* Hort. or Graham’s earlier description of *Anadenia manglesii* prior to publication. However, even if he were, he could have been operating under the existing ‘Kew Rule’, as Mabberley (2020) has pointed out, whereby the first name to be used in any particular genus was considered to have priority in that genus over the first published specific name, if that epithet had been published in another genus. McGillivray and Makinson (1993: 427) nominated, as holotype of *Manglesia glabrata*, a specimen collected by James Drummond, presumed here, for reasons already stated, to be from the consignment of unsorted and unnumbered specimens sent in the *Joshua Carroll*, and which arrived in 1839.

In appreciation of the specimen books, correspondence and specimens in sets loaned or given by Mangles which he used so extensively, Lindley (1840e) wrote to Mangles on 14 January 1840. ‘With this I have the pleasure to enclose for you a nice bit of “*Manglesia vestita*” and a live branch of “*Manglesia glabrata*” which latter your brother gave us a plant of - the other I have never seen - *Manglesia glabrata* is the only species in this country, so far as I know. I am waiting impatiently for a copy of my Appendix for you from the binder...’ Stafleu and Cowan (1981) state that Lindley’s ‘*Sketch*’, issued as an Appendix to Volume 23 of Edwards’ *Botanical Register*, was published in three parts, two respectively in November and December 1839, the final and third part on 1 January 1840. However, this letter from Lindley suggests a slightly later date, after 14 January 1840, for effective publication of the third part. On 4 February 1840, as recorded in the minutes of an Ordinary Meeting of the Horticultural Society of London (The Secretary 1840: 126), of which Lindley was Assistant Secretary and indeed, according to its historian Harold Fletcher (Fletcher 1969), its backbone and greatest servant, *Manglesia glabrata*, ‘a new and pretty shrub from the Swan river’ was exhibited with other flowers from the Society’s own garden at Chiswick, courtesy of the donation by Robert Mangles, already alluded to (Lindley 1840e).

Among the Drummond specimens that arrived in Lindley's herbarium in 1839 was a specimen of *Manglesia vestita* (CGE13286) from which, it must be presumed, that Lindley either detached a piece or a duplicate, and gave it to Mangles. Even so, soon after Endlicher published the name *Manglesia vestita*, the current concept of that species was established and continued in horticultural catalogues, contrary to doubts raised by McGillivray and Makinson (1993: 447). Although Lindley, by 1840, had become aware that *Grevillea manglesii* Hort. and *Manglesia glabrata* were synonymous, another specimen of *Manglesia* sent by Drummond in 1839 was overlooked for description by Lindley (*M. vestita* var. *angustata* Meisn., CGE13287). Drummond (1842c) summarised the situation for readers of the *Inquirer* 'Of *Manglesia*, a new genus lately separated from *Grevillea*, we have 7 or 8 species; I believe all the known species of the genus are from Swan River; the finest of them, the *G. Tridentifera* [sic], now in full flower in the York and Toodyay districts, is called by the settlers the Swan River Hawthorn, as, from the number of its snow-white flowers, and the size and shape of the plant, it bears some resemblance at a distance to the favourite English hawthorn.' [Perhaps, in the dark, with the light behind!] The name *Grevillea paniculata* Meisn., a glabrous shrub, has today replaced the name *G. tridentifera* (Endl.) Meisn., although it had not been published when Drummond was writing. Indeed, *Manglesia* was not formally synonymised under *Grevillea* until 1845 (Meisner 1845). Endlicher's extensive description of *Manglesia tridentifera* does not unambiguously point to any one species, and because the type specimen, which was collected by John Septimus Roe between 'Swan-River and King George's Sound' is missing, despite searches at numerous European herbaria including W, it cannot be neotypified with confidence, and is therefore treated as a name of uncertain application.

Lindley mentioned very few specimens in the 283 species which he described in the 'Sketch' that could be cited as types. However, he made clear in the introduction (Lindley 1839a: ii) and in a pamphlet circulated and published in several places (Lindley 1840b) as to what collectors and specimens he owed the greatest debt. Typification of his 283 species has mostly proceeded on the basis of this information. The specimens which Lindley championed both there and in the text were mainly those collected by James Drummond. Other acknowledgements from the introductory section (see Part 1) included James Mangles himself, Robert Mangles, Andrew Toward (fl. 1816–1840) gardener to the Duchess of Gloucester, and Nathaniel B. Ward (1791–1868), inventor of the Wardian case. Garden specimens of Australian plants raised mostly from seeds by Andrew Toward and mounted in specimen books (Loudon 1828b) presumably comprised the specimens made available to Lindley. Some of Toward's specimens are now at CGE and a specimen of *Manglesia glabrata*, presumably a specimen raised originally from seed by Hugh Low or Robert Mangles, is mounted with the lectotype of that species. Ward's contribution seems to be that he made available to Lindley Drummond specimens loaned to him by Mangles (Ward 1838).

Specimens supplied by other collectors were not acknowledged separately by Lindley. These include specimens collected by ship's surgeon Alexander Collie (1793–1835) one of which was cited specifically by Lindley (1840a: li) in his description of *Caladenia marginata*. The specimen Preiss 445 was also used in the description of *Aristida aristata* by Lindley (1839b: 25). Fifty three specimens supplied by Ludwig Preiss (1811–1883) and sent to Mangles by G.F. Moore were distributed to Lindley among others (J. Mangles undated a). Although Lindley was aware and impressed by Georgiana Molloy's specimens, and noted (1839c) that 'many of the best are quite new' he failed to acknowledge her anywhere. The omission has been rectified in several lectotypifications subsequently and Patrick (2005) lists the type status of many other Molloy specimens in relation to species described by Lindley, both in the 'Sketch' and elsewhere.

Linking the synonyms

The botanical nomenclator Ernst Gottlieb von Steudel (1840: 83) first linked the formally published name *Anadenia manglesii* Graham with *Manglesia cuneata* Endl., as Mabberley (2001) noted, thereby indirectly linking the name *Grevillea manglesii* Hort. Endlicher (1842a: 287) also indicated that synonyms of *Manglesia cuneata* included *Manglesia glabrata* Lindl. and *Grevillea manglesii* Hortul., a more direct linkage, but one in which Endlicher prioritised *Manglesia* over *Grevillea* and did not cite *Anadenia manglesii*. Endlicher (1842b: 37) reported also that Brown said that the genus *Anadenia* should be suppressed and that even *Manglesia* could not be tolerated.

When Meisner (1845: 534) synonymised *Anadenia*, *Manglesia* and other genera under *Grevillea* R.Br. ex Knight, he recognised *Grevillea glabrata* (Lindl.) Meisn. as the name with the greatest claim to priority (p. 549). Although he noted Endlicher's *Manglesia cuneata* as an earlier, 'validly' published name, he elected to treat it as a synonym on the basis that Lindley's treatment was more convincing, 'quia magis distinctivum'. He also cited as synonym *Anadenia manglesii* Graham in Hooker (1841), postdating Lindley's *M. glabrata*, instead of Graham's earlier publication in 1839, certain knowledge of which actually did not re-emerge into the light until c. 1992–3. Therefore, the combination *Grevillea manglesii* with the correctly dated basionym was not made by Meisner. Meisner (1845, 1856) cited unnumbered Drummond specimens collected between 1837 and 1839 as 'Coll. 1'. However, *Drummond* 'Coll. 1' usually refers to numbered specimens gathered for W.J. Hooker

from 1842. It is well to be aware of these differences between William Hooker and Meisner in the citation of Drummond's early specimens by Meisner.

Mabberley (1990: 274) noted that Planchon (1858: 96) accepted the name *Grevillea manglesii*, but the significance of this with respect to Graham's publication was still unrealised and the authority Hort. ex Planch. was proposed by him. In 1992, Graham's original (1839) publication of *Anadenia manglesii* was recognised and McGillivray (1993: 427), unaware of Mabberley's discovery, incorrectly altered the previously accepted name from *Grevillea glabrata* to the isonym *Grevillea manglesii* (Graham) McGill., and proposed as neotype a cultivated specimen (E00438973). Independent of Mabberley (1990), whose paper they had not seen, Olde and Marriott (1995: 14) accepted the name and authority of *Grevillea manglesii* (Graham) Planch. because Planchon had cited the validly published name *Manglesia glabrata* Lindl. as a synonym. Planchon did not cite *Anadenia manglesii* Graham in synonymy, though the name had already been linked by Meisner (1845).

Makinson (2000: 421) in the *Flora of Australia* also took account of Planchon's name, which by then was incorporated in *Index Kewensis*. Although warning that there might be an earlier valid usage of the binomial in other horticultural texts, Mabberley (2001) elaborated on the validity of Planchon's combination. He pointed out that *Grevillea glabrata* (Lindl.) Meisn. was effectively illegitimate because of the inclusion of *Anadenia manglesii* in synonymy. In proposing the revised authority (Graham) Planch., he was unaware that Olde and Marriott (1995) had already independently adopted it.

In connection with work for a paper on competing German botanical texts (Mabberley 2020), David Mabberley (pers. comm. 1 November 2020) communicated an even earlier valid publication of *Grevillea manglesii*. An extensive catalogue of plants issued in Dresden by Traugott Jacob Seidel (Seydel) (1775–1858), a member of a famous horticultural dynasty, 'Pflanzen-Catalog für das Jahr 1846', includes 'Grevillea Manglesii (*Manglesia cuneata*)' among the plants for sale. So far, despite the concerted efforts of Clemens Wimmer (Potsdam) and Dr. Stefan Dressler (FR), no copy of the original catalogue has been found, but it was reprinted by Mettler and Otto in a horticultural journal the same year. The possibility of an even earlier Seidel work or other publication validating the combination can still not be ruled out.

Ongoing searches of early horticultural catalogues by the author have recently revealed that 'Grevillea Manglesii' was first listed for sale in the 1838–39 catalogue of S. and J. Rinz of Frankfurt, Germany where on P.27 it was recorded, *nomen nudum*, with 13 other species of *Grevillea*. However, more significantly, in the catalogue of A. and N. Baumann (1843–44: 27), 'Grevillea Manglesii Hort.' and its synonym '*Manglesia cuneata* Endl.' were listed together in the correct order, thus providing the necessary linkage to date for the earliest legitimate combination of the name *Grevillea manglesii*. Augustin and Napoléon Baumann, two younger brothers of Joseph Baumann, from Bollwiller and Mulhouse, Upper-Rhine (France) issued their first nursery catalogue in 1843–44 under their own name. At 33 pages, the catalogue greatly expanded the 14-page catalogue of John Baumann and Sons in which *G. manglesii* was listed *nomen nudum* (1841–42: 11). It seems clear from a note on the last page by Joseph-Bernard (Jos.-B.) Baumann, the oldest brother, and foreign corresponding member of the Horticultural Society of London from 1826, that 'la société des frères Baumann' had recently and probably unhappily dissolved 'after 40 years work and experience in the old business which I founded and led', and that Joseph Baumann and his sons, Alexandre and Eugène, would henceforward trade under the name 'Jos. Baumann et Fils'. His brothers Augustin and Napoléon would henceforward operate a separate business and it is in their first catalogue that the validating linkage was made.

James Mangles

Captain James Mangles RN, FRS (1786–1867) was pivotal to the introduction of most Australian plants to English horticulture and botanical science during the 1830s. A biography by Richards (2002: 398) summarises his life well but incorrectly states that the pioneering settler George Mangles was his brother. James Mangles was a retired English naval captain, noted traveller, and friend of John Lindley and J.C. Loudon (1783–1843), the garden writer, whom he met and accompanied from Genova to Firenze in July 1819. According to Loudon's wife (J.W. Loudon 1845: xxvii) Mangles, together with his friend and ultimately brother-in-law Charles Irby RN, travelled with Loudon along the shores of the Mediterranean, 'leaving Genoa [Genova] on the 6th July in a felucca for Leghorn [Livorno], where they arrived on the 8th, and thence proceeded through Pisa to Florence [Firenze]' looking at gardens along the way. Thereafter, Mangles formed a life-long friendship with the Loudons, husband and wife, and his deep interest in horticulture included an interest in public garden design and amenity that appears to date from that time. Earlier in the same year, at Marseilles, he met and formed a strong friendship with James Stirling, then a naval confrère (Statham-Drew 2003: 23). Subsequently, following an invitation from Mangles to visit 'Woodbridge' near Guildford, Surrey, the home of Mangles' then more famous uncle, James Mangles MP (1768–1838), Stirling met his future wife, Ellen, then at the tender age of 13, and for whom he developed first a deep infatuation and subsequently an abiding love. James Stirling and Ellen Mangles eventually married one week before her sixteenth birthday, thereby accumulating a

debt to James Mangles for his part in occasioning their meeting and their apparently long happy life together subsequently which yielded 11 children (de Mouncey 1930). Stirling's leadership of the Pinjarra massacre of the Binjareb Aboriginal people on 28 October 1834 has blackened the memory of his other achievements.

Between 1835 and 1838, Mangles was the main distributor of seeds and dried specimens flowing from Swan River to English horticulturists. Much of what we know about him derives from unpublished correspondence held in the J. S. Battye Library, Perth, known as Mangles' Letter Books. The Letter Books contain mainly inward correspondence relevant to Mangles' important but honorary role as importer and distributor of seeds, especially from Australia. It is worth noting at this point that the conserved correspondence is pseudo-original, letters, or sometimes only excerpts, neatly copied by the hands of at least two anonymous transcribers, and the detail combined on numbered pages, now scanned onto microfilm, the pages loosely grouped by date or sender, but not well indexed or arranged. Although there is little by way of original communication emanating from Mangles, much can be inferred from replies to him.

The accumulation of this correspondence occurred after Mangles had returned from the Swan River colony, where he had arrived on 25 April 1831 on the *Atwick* with its complement of 13 passengers (J.S. Battye Library). He was then 45 years old, unmarried, and childless, as he remained all his life, contrary to a misstatement by Coats (1973) that he had a son who outlived him. The sole beneficiary of his substantial will was his housekeeper (Kirwan 1936, Statham-Drew 2003). In a letter dated 5 December 1830 to the Admiralty seeking two years' leave, Mangles (1830) gave as his reason 'in order to explore that country' (Statham-Drew 2003: p. 575). The main real purpose seems to have been to investigate shipping opportunities for the Mangles family interests, and to visit his cousins George Mangles and Ellen Stirling and his friend James Stirling, her husband and by then, Lt.-Governor of the Swan River colony. Mangles apparently lived with them during his stay and supported his pregnant cousin who was undergoing difficulties at the time.

According to Drummond (1843) Mangles arrived at Fremantle bearing four cultivars of olive that were planted in the Government Garden and propagated by 'laying' in 1832. The ongoing acknowledgement for this first introduction to Western Australia bears witness to Mangles' foresight and thoughtfulness. Erickson (1969: 17) states that Mangles was in Western Australia for three months. Plant specimens at B, BM, CGE, GH and K (*vide* Orchard 1999 in part) attest to his activities and interests while resident there. Cameron (2006: 29) records that on June 22 1831 George Fletcher Moore (1798–1886) went on a 'botanising excursion with Mrs Stirling, Mrs McD., Capt. Mangles and Mr Dale (Lieut.)' and that (*ibid.*: 32) on July 10 Moore 'gathered many varieties of beautiful plants and shrubs for Capt. Mangles.' Moore (1884: 50) notes that on July 21 he also gave Mangles 'specimens of flowering shrubs besides a bottle full of snakes, lizards and scorpions', thereby confirming Mangles' botanical and natural history interests. A specimen of *Grevillea bipinnatifida* R.Br. collected on 12 August 1831 (BM915609), records his presence four months after his arrival, and is the latest dated evidence, though other specimens were also collected in 'August'. An undated specimen of *Grevillea excelsior* Diels (CGE05816) from beyond the Perth region might possibly have been given to him by another person as there is no evidence that he went exploring. Although he undertook local trips up the Swan River by boat with friends (Moore 1884), this area is well outside the known distribution of that species. According to Chate (1867), Moore himself accompanied Ensign Robert Dale to the York District in September 1831 and either he or Dale or even Stirling himself, may, I here speculate without evidence, have been the source of this specimen.

These notes represent a refutation of a printed note appended to herbarium sheets of many Mangles' specimens by Ms J.E. Tonkin (ABLO 2006–2007) variously dated in 2007, who asserts, in part and without supporting corroboration, that there is 'no evidence' that Mangles collected plants during his stay. This conclusion stands in stark contrast to the evidence presented here. There are over 20 specimens attributed to Mangles as collector with both printed and handwritten labels at B, BM, CGE, GH, K (*vide* Orchard 1999 in part). The printed labels date from the time when Mangles was active, apparently printed by Hooker, and are similar to those used for Drummond's specimens, about which no similar doubts about authenticity are raised. Equally there is also no evidence that the specimens of others were arrogated by him, as also suggested by Tonkin in the appended note, except to say that there are at least 77 specimens, of which only seven have been located at BM, that were loaned to Lindley in 1837 mostly without collector details.

The date of Mangles' departure from Swan River is not known with certainty but he may have left on the *Egyptian* on 28 December 1831, apparently the only passenger ship to call at Fremantle after June (<http://www.perthdps.com/shipping/>). However, a passenger list has not been seen and G.F. Moore (1884: 64) was able to send correspondence out earlier, in September, via *The Cruizer*. References to Mangles presence at Swan River disappeared from Moore's diary in late July, 1831. Regardless, Mangles was certainly there longer than three months, probably four, and possibly as long as eight months. While there, he made the acquaintance of the gregarious Dublin-born member of the ruling elite, George Fletcher Moore, wealthy lawyer, singer, and ultimately extensive landowner, Advocate-General and also, for a time later, Acting Colonial Secretary.

Moore's published diary and correspondence (Doyle 1834, Moore 1884, Cameron 2006) is an important historical record of early settler life. Curiously, for a person interested in plants, Mangles seems to have formed no friendship with James Drummond (1786–1865), a working-class man, but the Colony's honorary botanist and naturalist, its most knowledgeable horticulturist, and ultimately its most important botanical collector. Apparently he preferred the company of his wealthy upper-class peers and relations. Possibly Mangles felt humiliated by Drummond who, when taken to see 'a frog with a tail' that Mangles had gleefully discovered, responded 'Hoot mon, it's naething but a tadpole' 'to the great mortification of Capt. M.' (Cameron 2006: 159–160). Although Cameron has published the most comprehensive version of Moore's diary and letters, he was apparently unaware of unpublished correspondence in Mangles' Letter Books.

After his return to England, according to Erickson (1969: 17), Mangles became 'infected with the fashionable fever for growing exotic plants', especially those from Western Australia, and then probably under the influence of his older brother, Robert. Robert Mangles (1781–1861), an independently wealthy landowner whose large home 'Whitmore Lodge' and garden at Sunning Hill, Berkshire, were described in fastidious detail by Loudon (1829), specialised in showing plants at exhibitions of the Horticultural Society of London. He was a leading exhibitor of newly introduced Swan River plants, for which he won numerous medals. As a cousin to Ellen Mangles, wife of the first Governor of the Swan River colony Sir James Stirling, he was especially favoured with seeds collected for his garden by them. There is no evidence that James Mangles returned with seeds to complement his specimens, among which there are, in any case, no specimens of *Grevillea manglesii*.

Although James Mangles had the advantage of incumbent wealth, Joseph Harrison (1839: 66) gave an insight to his centrality to plant introductions and a glowing impression of his generosity, writing 'We understand that [certain] flowering plants had been introduced into this country by Robert Mangles, Sunning Hill, Berks. but our correspondent informs us that the merit of introducing them, as well as a considerable number of the most showy of recent introduced plants, belongs to Captain Mangles R.N. That gentleman has been assiduously engaged for the last eight years, in introducing seeds from that most interesting portion of the globe, the Swan River colony. To accomplish so desirable an object, Captain Mangles went expressly on purpose, to see the flora of that country, and resided there for some time. To contribute to the pleasures of those interested in beautiful flowering plants in this country, Captain Mangles has expended a very considerable sum of money; and equally so in procuring and sending out presents of plants, books, maps &c from this country, to botanists resident at the Swan River colony, Ceylon, South Australia, Valparaiso, and other places with a view to stimulate them to collect and send seeds &c to this country. Immediately on receiving packets of seeds, with a liberality which entitles Captain Mangles to the thanks of every botanist in this country, they are distributed gratuitously to the principal nurserymen, and other plant establishments belonging to the Nobility and Gentry. We wish those persons having connexions [sic] in the distant and portions of the globe would imitate the very laudable zeal of Captain Mangles, introducing seeds of plants, and which in many instances might be procured at but a small expence [sic], we should soon have plants in our collections of many splendid flowers, of which we have only had descriptions, or a specimen sent us.'

Origins of Grevillea manglesii Hort.

The horticultural pedigree of *G. manglesii* Hort. is here examined, not least to correct the historical record, more broadly but also to perhaps identify the original seed collector and supplier. Donn (1845: 64), Sweet and D. Don (1839: 588) and Hereman (1868: 31) all agree on the year 1836 as the date of introduction for *Anadenia manglesii* in England, although Donn also treated *Grevillea manglesii* Hort as a synonym of *Manglesia glabrata*, and erroneously gave them a later date (1838). More importantly, no known listing in any European horticultural reference or catalogue predates the introduction of *G. manglesii* or its synonyms in England. Hooker (1841), following Graham (1839), stated that it was 'introduced to our gardens by Mr. Lowe [sic]'. However, Lindley (1840c) stated that '*Manglesia glabrata*, a synonym of *G. manglesii*, has found its way into gardens, having been raised from Swan River seed by Robert Mangles, Esq.' Consequently, unnamed grevilleas grown successfully from seed in or before 1836 by Robert Mangles and/or Hugh Low are particularly apposite to any investigation about the introduction of *Grevillea manglesii* Hort. and *Anadenia manglesii* Graham.

Although there are a number of candidate seed suppliers, among them Captain James Mangles himself, Governor Sir James Stirling or his wife Lady Ellen Stirling, William Morrison (fl. 1824–d. 1846), James Drummond or Johnston Drummond (1820–1845), his son, the last-named is revealed as the most likely contender, though none can be established or eliminated with complete certainty.

Sir James Stirling

In discussing the introduction of *Morna nitida* Lindl. (= *Waitzia nitida* (Lindl.) Paul G. Wilson), Lindley (1837a) reported that Robert Mangles had received seeds direct from Governor Sir James Stirling in January 1835, some of which germinated in 1836. Subsequently he (*ibid.*: 1837b) published a correction by Donald Mackay, Robert

Mangles' gardener, who stated that the 'seeds were imported..in the beginning of 1836 by Mr Robert Mangles, sown the 2nd February 1836 in rich light mould...'. No mention was made of Stirling as the source in this revised but still relevant account. Several authors have independently named Stirling as the source of seeds for other cultivated Swan-river species and James Mangles (c.1838) confirmed them, stating there that Stirling was also responsible for seeds of *Rhodanthe manglesii* Lindl., about which it might easily be assumed from Lindley (1834) that the source was James Mangles himself. Apart from seeds remitted from the colony, Don (1835a) reported that Stirling brought seeds back to England in 1832 and gave them personally to Robert Mangles.

Additional Australian species sourced to Stirling that flowered and were illustrated or otherwise treated or mentioned in English journals were *Anigozanthos rufus* Labill. (Loudon 1834), *Anigozanthos manglesii* D. Don (Don 1835a), *Rhodanthe manglesii* (Don 1835b), *Kennedyia marryatae* Benth. [= *Kennedia lateritia* F. Muell.] (Lindley 1835), *Kennedyia stirlingii* Lindl. (an orth. var. of *Kennedia stirlingii*) (Lindley 1836a), *Kennedyia ?macrophylla* Lindl. (= *Hardenbergia comptoniana* (Andrews) Benth.) (Lindley 1836b). Although Lindley (1837c) claimed Stirling as the source of *Hibiscus lilacinus* Lindl. (= *Alyogyne* sp. Geraldton (R. Davis 3487)), Mangles credits 'Lady Stirling'. Lindley (1837d) also claimed that Stirling was the supplier of *Anigozanthos manglesii* var. *angustifolia* Lindl. but Mangles (1838c) claimed, on his list, that 'Moore' was the source of this species, as well as *Morna nitida*. Of course, Moore did not collect any seed on his own account at this time, but if we assume that Mangles meant Drummond via Moore, additional evidence will be here adduced in support.

William Morrison

If Stirling is to be accepted as the source of early horticultural seed supply, it is reasonable to imagine that he had an assistant. William Morrison (fl. 1824–d. 1846), who gained a reputation as a seed collector in Western Australia, was strongly connected to Stirling, but, apart from occasional notes (e.g. Maiden 1909), Erickson (1969), Cameron (2006), a few contemporary newspaper articles, and a short biography in George (2009), little is known about him. Morrison was born in Renfrew, Scotland, but was recruited personally from Kew Gardens by Sir James Stirling in 1833. Morrison was working there as a gardener under John Smith (1798–1888), who was appointed the first curator when it became a public botanic garden in 1841. When Stirling returned to Western Australia in 1834, having earlier (in August 1832) travelled back to England to raise funds and seek new emigrants, he appointed Morrison to superintend 27 boys, aged 8–18 years old, 'a disorderly set' that Stirling had rounded up in various London parishes (Morrison 1833). Delayed for several months at Portsmouth and Spithead by weather unsuitable for sailing, Morrison twice wrote to Smith begging for a loan, informing him that he had run out of money. As a postscript, he reported that 17 of the boys had deserted (Morrison 1834). Morrison was already an alcoholic, reportedly addicted to rum from before 1828 when he was a sugar plantation manager in the West Indies. His source of income is uncertain. He may have received money from Kew to collect plants but may also have worked for the Stirlings as part-time gardener after his arrival in Western Australia.

During this time, he also undertook journeys of exploration around Perth. 'He is certainly very indefatigable in collecting and goes to out of the way places in the course of his searches' wrote Moore (1839). From 1837 he began to engage with James Mangles' correspondents, George F. Moore, and Captain Richard Meares (1780–1862), supplying them with seed and identifying plants and specimens. John Smith (1880) recorded not only that Morrison 'sent many seeds to this country and many of the first of Proteaceae' but, more significantly, that he was 'the first in the field, before Drummond'. Lack of any record or other evidence suggests that it is unlikely that Morrison ever gathered seed of *G. manglesii* or included it in collections of seeds sent to London for sale before 1836 on his own account. According to Moore (1837), who sent a small parcel of seed collected by Morrison to Mangles, Morrison was by then 'addicted to intemperance by which he nearly lost his life on a recent occasion' (See Perth Gazette 5 August 1837, P. 948 for further detail). The assumed connection between Morrison and Stirling is certainly speculative but it accounts for Morrison's movements and activities immediately after his arrival in 1834, as well as the supply of seed flowing from Stirling. Collecting seeds for his wife's cousin could be seen as a somewhat implausible occupation for the busy Governor himself.

James Drummond

The initiation of a trade in plants/seeds between England and the Swan River colony began in earnest with a request for seeds in a letter (written and sent in triplicate) on 24 November 1834 by Captain James Mangles to George Fletcher Moore. Two copies of the letter arrived together at Fremantle via the *Sir David Ogilby* on or about 5 July 1835 (Moore 1884: 271). The letter contained an order for £5 (=AUD\$800–900 in 2020 money) worth of seeds. In order that he might fulfil Mangles' request, perhaps by the same ship returning, Moore went immediately to see James Drummond who had been recently retrenched from his paid employment as Superintendent of the Government Garden and had removed himself and family to his grant in the Helena Valley (Erickson 1969). Drummond was deciding on a new career, whether as farmer, or seed and plant collector (Drummond 1836). Moore purchased 100 packages of seeds containing 'a complete assortment

of all the varieties of this colony' to fill Mangles' order. The seeds had been collected by one of Drummond's sons 'under the immediate superintendence of his father' for sale and export at 1/- per pack (Moore 1835a). Johnston, son of James Drummond, was, from the age of 15 (in 1835) collecting seeds, bird skins etc for sale in Cape Town (Drummond 1836) and it was to there that the collected seeds were probably intended before Moore laid claim to them.

Moore's first consignment of seeds arrived at James Mangles' address (York Chambers, London) on 29 January 1836, according to a note (?written by Mangles) on the accompanying itemised list (Moore 1835a). The seeds, which included five packets of unnamed *Grevillea* and five of 'Proteacea', had been collected mainly at Swan River, with some seeds [not provenance-listed] from Vasse, Augusta, King George's Sound. Despite the acknowledgement of Drummond's son Johnston as collector in Moore's letter, the list he sent to Mangles records that all seeds had been collected and named by 'Mr Drummond, the Botanist' (J. Mangles, undated b). Mangles adopted his customary practice of distributing the seeds, always some to his older brother Robert, as well as to his aristocratic friends and favoured nurserymen. Although in later years Low's nursery was not a regular recipient of Mangles' disposals, no doubt because he was importing seeds directly from Drummond himself, he may have received seeds from this consignment, either directly or through Robert Mangles, in the same way that Sir Joseph Paxton (1803–61), gardener to William Cavendish, Duke of Devonshire, received seeds from Mangles directed to him through Low (Paxton 1838). Low's Clapton Nursery also seems to have been the likely common source of sale and distribution of *Grevillea manglesii* within the United Kingdom, certainly to Scotland, and probably the rest of Europe, where plants in cultivation are recorded with the same name in Austria, Germany, France and Italy, from as early as 1837 (Rinz (1838–39), Baumann et fils (1841), Endlicher (1842), Seidel (1846) Pépin (1838), Planchon (1858).

Although seeds sent by George Fletcher Moore in 1835 to James Mangles were the probable source for the introduction of *Grevillea manglesii* Hort. and *Anadenia manglesii*, nowhere is it directly stated and, without further evidence, cannot be proved. Although preserved correspondence (Drummond 1837) between Drummond and Loddiges' Nursery indicates that Swan River seeds and plants were despatched to them at some stage, *G. manglesii* did not subsequently appear in their sale catalogue (e.g. Loddiges 1849). Drummond had also earlier sent a few seeds himself in a letter dated September 1835 in his correspondence with Mangles. 'The few seeds I enclose you in this letter' he wrote 'are all of particular beautiful plants, they are all good, but the beautiful scarlet *Grevillea* [probably *G. wilsonii* A.Cunn.] which I fear is scarcely ripe enough, is a most magnificent plant growing about 6 feet in height in large spreading bushes in the sort of soil marked No. 2, so it will be of importance to have that examined for the sake of being able to grow among the fine plants of this colony to perfection'. There is no further account of this despatch in the historical evidence, and certainly *G. manglesii* could have been among the seeds as it grows in locations and habitats similar to *G. wilsonii* in the Darling Range. However, the species is not particularly beautiful and seeds of *G. manglesii* included by Drummond on this occasion are considered here to have been an unlikely inclusion.

Erickson (1969: 21) documents however that the seeds sent by Moore 'proved valueless, for grubs destroyed the contents of all the packets', the evidence no doubt being a letter from Drummond to Mangles (Drummond 1836) in which he wrote 'I was sorry to hear that the seeds sent you by Mr Moore were destroyed by grubs. I will take particular care in future that the eggs of insects are not put up along with them.' This statement of events is in serious conflict with historical evidence presented here. Drummond was misinformed, it seems, and the seeds in question were probably those he sent in September 1835.

In April 1836, Robert Mangles (1836a), a weekly correspondent with his brother around this time, wrote with reports of successful germination of a large number of Swan River seeds. A more detailed report was given by letter in October (*ibid.*: 1836b) in which five different but unnamed species or varieties of *Grevillea* were germinated, along with many other species, roughly consistent with Moore's list. One of the unnamed *Grevillea* species was almost certainly *Grevillea manglesii* Hort. The fate of the remaining four species germinated by Robert Mangles is unclear. However, Donn (1845) listed, as *nomina nuda*, four species in *Anadenia* that were also introduced in 1836 with *Anadenia manglesii*, species otherwise unaccounted from any other known source but all described by Lindley in 1839 viz. *A. aquifolia* Lindl. (= *G. monticola* Meisn.), *A. flexuosa* Lindl. (= *G. flexuosa* (Lindl.) Meisn., *A. gracilis* Lindl. (= *G. synapheae* R.Br.) and *A. tenuiflora* Lindl. (= *G. tenuiflora* (R.Br.) Meisn.). It is possible that, when specimens of these species were collected by Drummond at various times, seeds were also collected when available and were therefore included among those purchased by G.F. Moore.

Ellen Stirling

Robert Mangles (1836a) also indicated that he had received seeds from his cousin Ellen Stirling in April 1836, from which he had successfully germinated *Chorizema cordatum* Lindl., the cultivated specimen formally described in 1838 by Lindley (1838f). While Ellen Stirling wrote and certainly sent seed to James Mangles,

there is no further reference to this despatch and it is thought that these were the only seeds sent or successfully germinated on that occasion.

Hugh Low

Heynhold (1840: 368) listed *Grevillea manglesii* Mack., without synonyms, confirming that the name was used (and probably arose) at Mackay's Clapton nursery, famed for its introductions of Australian plants, which had been taken over in 1831 and eventually renamed Low's Clapton Nursery by Hugh Low (1793–1863). Lindley (1831: t. 1423) stated that Low had been 'eight years foreman' in the establishment and one 'to whose careful management the success that has attended the raising the many important collections received by Messrs Mackay and Co. during that period, is very much to be attributed.' These include seeds collected in the 1820s by William Baxter (1787–?1836). There appear to be no extant pre-1840 catalogues of Mackay's Clapton Nursery. However, lists appeared in several editions of the *Gardeners' Chronicle* (1841) under Hugh Low's name, where *Grevillea manglesii* Hort. was offered for sale, *nomen nudum*, as *Manglesia glabrata*. It is likely that Heynhold derived his nomenclatural reference from access to an earlier sale catalogue of Low's that listed it as *Grevillea manglesii*, and which also probably circulated in Europe from 1837, judging from the cultivation of *G. manglesii* Hort. near Ris, France in 1838, under the same name (Pépin 1838).

It has been recorded (R. Barker 2005) that Low was a subscriber to James Drummond's collecting sets, because some specimens subsequently found their way to Kew, where they were presented in 1915 by the Linnean Society 'ex Hb. Hugh Low Esq.' (e.g. *Grevillea candolleana* Meisn. K799382, *G. drummondii* Meisn. K799511, *G. hookeriana* Meisn. K799240, *G. wilsonii* A.Cunn. K799525). Low probably could have afforded the cost, but was not a botanist who might have been interested in the majority of the species and there is no evidence that he received hundreds of specimens, 500 of which constituted a full set. However, an explanation for specimens in his possession might be contained in an undated note to Mangles (Drummond ?1838), in which Drummond wrote 'Mr Drummond would be much obliged by Captain Mangles showing the specimens of Proteaceae and others to Mr Low of the Clapton Nursery or a person he may send to look, as most of them are plants of which he is sending him the seeds.' From this Drummond confirms that he collected both specimens and seeds. It is possible that Mangles gave Low the relevant specimens or a duplicate thereof.

Summary

The inescapable conclusion that the seeds sent by Governor Stirling which arrived in 'early' 1836, and the despatch by G.F. Moore which reached James Mangles on the 29th of January 1836 were one and the same, cannot be overstated. That Drummond misunderstood or was misinformed about the state of most of the seeds sent by Moore is also shown by the evidence. The seeds (or most of them) were distributed to Robert Mangles, who germinated a large number (R.Mangles 1836a, 1836b), and through him probably also to Hugh Low (the only evidence being that Low had saleable plants of *G. manglesii* in 1837). Mangles letter (1836b) dispels any doubt that the seeds he lists are anything other than the seeds sent by Moore.

Pierre-Denis Pépin

According to Carrière (1876), Pierre-Denis Pépin (1802–1876) was the head gardener (chef de l'École de Botanique) at the 'Jardin' of the Natural History Museum, Paris where he worked for more than 60 years, in the process being awarded a Legion of Honour. Pépin and the nurseryman Henri Antoine Jacques (1782–1866), ultimately head gardener at Neuilly to King Louis Philippe 1, were contemporaries and both contributed articles to the French horticultural journals *Annales de flore et de pomone*, as well as *Bon Jardinier* and *Revue Horticole*.

Pépin's description (see below) of *Grevillea manglesii* which predates and supplants that of Graham, was submitted to Karen L. Wilson, a member of the General Committee on Nomenclature (ICN), who advised (27 January 2021) that 'In general, the view has been that there has to be at least one descriptive feature that, AT THE TIME OF PUBLICATION, would have uniquely singled out a particular taxon that was known to botanists in that era. So, for example, saying a plant had green leaves would not be adequate at any time for valid publication, but saying that it was a *Grevillea* with leaves looking often like those of *Ginkgo* back in 1838 MIGHT have been enough if there was, at that time, only one known species that had such leaves, i.e. it would be a unique feature. The existence or not of a specimen would be irrelevant to the valid publication of the name.'

Taxonomy

McGillivray (1986) recognised one autonymic and two non-autonymic subspecies in *G. glabrata* (Lindl.) Meisn., a name which was subsequently superseded nomenclaturally by *G. manglesii*. The subspecies recognised in the former correspond exactly with those in the latter species. The two non-autonymic subspecies recognised were subsp. *ornithopoda* (Meisn.) McGill. and subsp. *dissectifolia* McGill. Neither at the time of their initial

description nor in subsequent treatments has any argument been advanced for their recognition above the rank of subspecies, notwithstanding their occurrence in allopatric populations that are fully and reliably distinguishable and in which there is no evidence of morphological overlap or interbreeding.

McGillivray was philosophically adherent to his own very broad interpretation of the Biological Species Concept (BSC). Species were defined, following Ernst Meyer's definition, as 'a genetically distinct interbreeding group of organisms' and that 'the genetic distinctness of a species was evident from its phenotype' (McGillivray 1994: 3). However, since the capacity to interbreed had to be assumed for allopatric populations determined as subspecies, their relationship and classification was based on the conceptualised autonymic phenotype. In the McGillivray classification model, non-autonymic subspecies are fully distinguishable, and their inclusion as segregates of the autonymic phenotype required a judgement that these population-level differences were somehow trivial or taxonomically less important than characters used to justify recognition of distinct species. In particular, his focus on consistency in floral and inflorescence structure as pre-eminent and the treatment of other characters, both sexual and non-sexual, as less significant has resulted in differences of opinion, culminating already in the deconstruction of several of his species by advocates of a narrower species concept. Olde and Marriott (1993), who then held a similar biological species concept before subsequently and recently adopting a phylogenetic model, continued this trend, but even they recognised subspecies that now warrant reconsideration of their rank.

Results from techniques, not then available to McGillivray, but developed subsequently, to examine phylogeny and analyse relationships, have repeatedly shown that morphology is not necessarily a reliable guide to relationships. Holmes *et al.* (2014) resolved *Grevillea montis-cole* subsp. *brevistyla* R.V.Sm. in a different clade from subsp. *montis-cole* R.V.Sm. Other supposed close relationships between *Grevillea* species were similarly unmasked in the time-calibrated phylogeny of subtribe Hakeinae presented by Mast *et al.* (2015). Moreover, the Phylogenetic Species Concept in one form or another has largely replaced the Biological Species Concept in systematics.

Phylogenetic species are never broadly conceptualised or seen as reproductive isolates with a focus on sexual characters but rather as holistic organisms or population-level units of an ancestor-descendent lineage. The operational definition of a phylogenetic species, here endorsed, has been given by Grubb and Groves (2011: 1) who treated them as 'the smallest population or aggregation of populations with heritable differences from other such populations or aggregations'. Small morphologically discontinuous differences at the population level can be seen as an evolutionary step and can be accepted *prima facie* as evidence of lineage separation, especially in allopatric species segregates. They can be diagnosed by a unique character or combination of character states that are not necessarily autapomorphic, in a system where all characters are equal, and not assembled into an hierarchy. Moreover, these populations can be tested and relationships inferred. They rebut the notion of reproductive isolation as a definition of species because molecular studies have shown that species do share genes in nature but can still persist as discrete entities. There is no further need to explain what isolating mechanisms are, nor how and why they might break down. Introgression or occasional hybrids in sympatric species in the wild are to be expected between closely related species and isolating mechanisms seem to rarely present a problem to horticultural breeders wishing to create hybrids.

In such a scheme, the rank of subspecies is questionable. Subspecies are usually defined as allopatric or geological population(s) that differ morphologically and perhaps genetically very slightly but not discontinuously from nomino-typical populations and are capable of interbreeding, though this latter proof is usually wanting *in situ*. Grubb and Groves (2011) indicate that 'good' subspecies are 100% diagnosable; 'hence they are actually distinct species masquerading as mere subspecies - victims of the general feeling around the mid-20th century (and certainly under the influence of the BSC) that taxa should be, if possible, relegated to the status of subspecies of the nearest species as long as they do not occur together.' There is an implied corollary also that some undefined species distance or degree of distinctiveness must be accepted. Although accepting subspecies as narrowly distinct species runs the risk of taxonomic inflation, according to criticism from those who argue that 'trivial' differences simply constitute phenotypic variation, there is no evidence that this is imminent. Trivial differences can only be identified in a hierarchical approach in which some morphological characters are considered more important than others, such as floral or sexual characters (underpinned by the view that species can only evolve by sexual means cf. environmental pressures). Discontinuous phenotypic variation or 'small' morphological differences at the population level are here seen as an evolutionary step and can be accepted *prima facie* as evidence of lineage separation and therefore warrant co-equal, specific recognition.

Subspecies can be accepted when there is morphological overlap and differences can be diagnosed at high frequencies but not absolutely differentiated at the population level. The rank could also prove useful as a temporary category where different populations have been identified but require further analysis. Fully diagnosable taxa at subspecies rank require empirical evidence of inclusion, not simply subjective opinion.

Morphology

Species in the *Grevillea manglesii* assemblage are distinguished on the basis of their foliar differences. Other characters here summarised are not repeated under individual species description. A comparison of seedling morphology awaits analysis.

Summary of characters: *Mature plants* glabrous in all parts except occasionally where indicated, seed-obligate, stenobasic, putatively self-compatible. *Branchlets* sometimes glaucous, slender, subterete in cross-section, a faint rib decurrent from leaf base above. *Leaves* petiolate, slightly discoloured; *new growth* red, pink or coppery at tips, soon light green to bluish-green, scattered hairs usually evident on very young growth; *leaf and lobe apices* acute, spinescent; *leaf spines* 1.25–3 mm long, non-pungent to occasionally pungent; *leaf margins* flat or very shortly recurved, with a slightly thickened, discoloured marginal vein; *basal internode* when present, not reduced in length when subtending axillary growth; *adaxial surface* dull, the midvein evident, secondary veins relatively obscure; *abaxial surface* exposed, midvein prominently raised, reticulum obscure; *petioles* normal, the point of attachment truncate. *Conflorescences* simple–3-branched, terminal, subterminal and axillary, partially enclosed within foliage; *buds* 2–3 mm long, 1 mm wide, ovoid, forming and developing sequentially from base of principal rachis, not overarched by bractiform leaves, not arrested in development, pedunculate; *unit conflorescences* c. 3 cm diam. regular, subglobose, loose; *peduncles* erect or decurved in bud; *common bracts* 1.2–2 mm long, 0.5–0.9 mm wide, ovate-cymbiform or narrowly so, soon caducous. *Flower colour:* *Pedicels and perianth* usually white, often pink, the limb lemon-yellow; pistils white the pollen-presenter often ageing pink. *Flowers* actinomorphic externally, zygomorphic internally, the carpel acroscopic, slightly fragrant, scarcely to not nectariferous, entomophilous. *Pedicels* 8–15 mm long; *torus* c. 0.5 mm across, transverse to slightly oblique; *nectary* rising c. 0.2 mm above the toral rim, arcuate to oblong with upper margin entire, sometimes shortly recurved; *pistil* 3.3–5.5 mm long; stylar swelling c.0.5 mm maximum width, ovoid, sometimes appearing sessile; *pollen-presenter* conical, its base wider than the style-end; *stigma* 0.1–0.2 mm across; *perianth* actinomorphic, sometimes a few simple hairs on the adaxial surface; *limb* 1.3–1.7 mm wide, globose; *fruits* 7–10.5 mm long, follicular, one-seeded, oblong-obovoid; *exocarp* rugose, smoothly ridged or with rounded verrucae; *mesocarp* crustaceous.

Conflorescence development in the *Grevillea manglesii* assemblage follows a complex development pattern that is reflected throughout the *Triloba* Group. Branched conflorescences develop basipetally whereas individual unit conflorescences develop acropetally. The branch buds form sequentially and develop quickly from at or near the base, when most of the flowers in the distal unit(s) have reached anthesis or almost so. This pattern of flowering effectively extends flowering time rather than intensifies it, which would occur if all the branches and all the flowers in a unit conflorescence developed synchronously.

Interim key to distinguish species in the *Grevillea manglesii* assemblage adapted from Olde and Marriott (1994: 195)

- 14 Branchlets, leaves, peduncles and floral rachises glabrous
 - A Some or all leaves with secondary division, rarely simple; primary division frequent but not confined to the leaf apex; divided leaves 2–4.5(–5) cm long
 - B Leaves flat to irregular, trifid to bipinnatifid in the distal half; ultimate lobes of twice-divided leaves 0.3–1(–3) mm long, triangular, shallowly -fid; proximal lobes deeply dissected or not, but usually ascending*G. manglesii*
 - B* Leaves slightly divaricate, deeply dissected in the distal half; ultimate lobes of twice-divided leaves 7–20 mm long, linear to narrow-triangular; proximal lobes deeply dissected and spreading widely, sometimes descending*G. dissectifolia*
 - A* All leaves simple or with primary apical division only; divided leaves 5–8 cm long
.....*G. ornithopoda*
- 14* Either branchlets, leaves, peduncles or floral rachises densely to sparsely hairy.

Nomenclature and taxonomy

Grevillea manglesii Pépin, *Annales de flore et de pomone* 1837–1838, p. 381 (1838), as ‘Manglesii’.

Protologue. *Grevillea manglesii*, d’orangerie, et dont les feuilles, quoique très-variables, rassemblant le plus souvent a celles du *Ginkgo biloba*. [*Grevillea manglesii*, from the conservatory, the leaves of which, although very variable, resemble more often than not those of *Ginkgo biloba*.]

Neotype (here designated) [Paris, France] ‘Grevillea Manglesii’ P03354112 ex Hb. Jacques.

<http://mediaphoto.mnhn.fr/media/1441335820687jkjFuTNWFJBYK4Ay> (Fig. 1)



Fig. 1. Designated neotype of *Grevillea manglesii* Pépin (P03354112).

Discussion: Pépin wrote a report, published in *Annales de flore et de pomone* for 1838, on the plants in the ‘orangerie’ of the ‘bel établissement de Fromont’, which contained three *Grevillea* species. At that time (*fide* De Gaulle 1841), the Château de Fromont was unrivalled in Europe for its collection of exotic and rare plants from all over the world under the directorship of M. Soulange-Bodin. However, there is no appropriately dated *Grevillea* specimen collected from this garden at P. An undated specimen collected by Henri Antoine Jacques (1782–1866) of a plant in cultivation at the ‘Museum National d’Histoire Naturelle’ of which Pépin was the head gardener, is therefore proposed as neotype. This specimen is considered the most authentic, in the absence of a specimen collected by Pépin himself, above other anonymously collected candidate specimens at P, (P3354110, P3354111) collected at ‘Hort. Bot. Parisiensis’, all of which postdate Pépin’s article. Jacques was a journalistic colleague of Pépin, and a well-known and informed horticulturist, nurseryman.

The reference and association with leaves of *Ginkgo biloba* (see Fig. 2) identifies the species in sufficiently clear terms to accept the name *Grevillea manglesii* as validly published by Pépin. The description predates the more extensive description by Graham, but is here regarded as both adequate and taxonomically sufficient because it enables recognition by reference to a unique character ‘leaves very variable, but more often than not like *Ginkgo biloba*’. It is distinguished from all other species of *Grevillea* described prior to 1838, including those of Brown (1810) and (1830), and therefore, under the rules of botanical nomenclature (*viz.* Turland *et al.* 2018, Article 38.2 and 38.4 ex.9), is here taken as valid publication of the name.

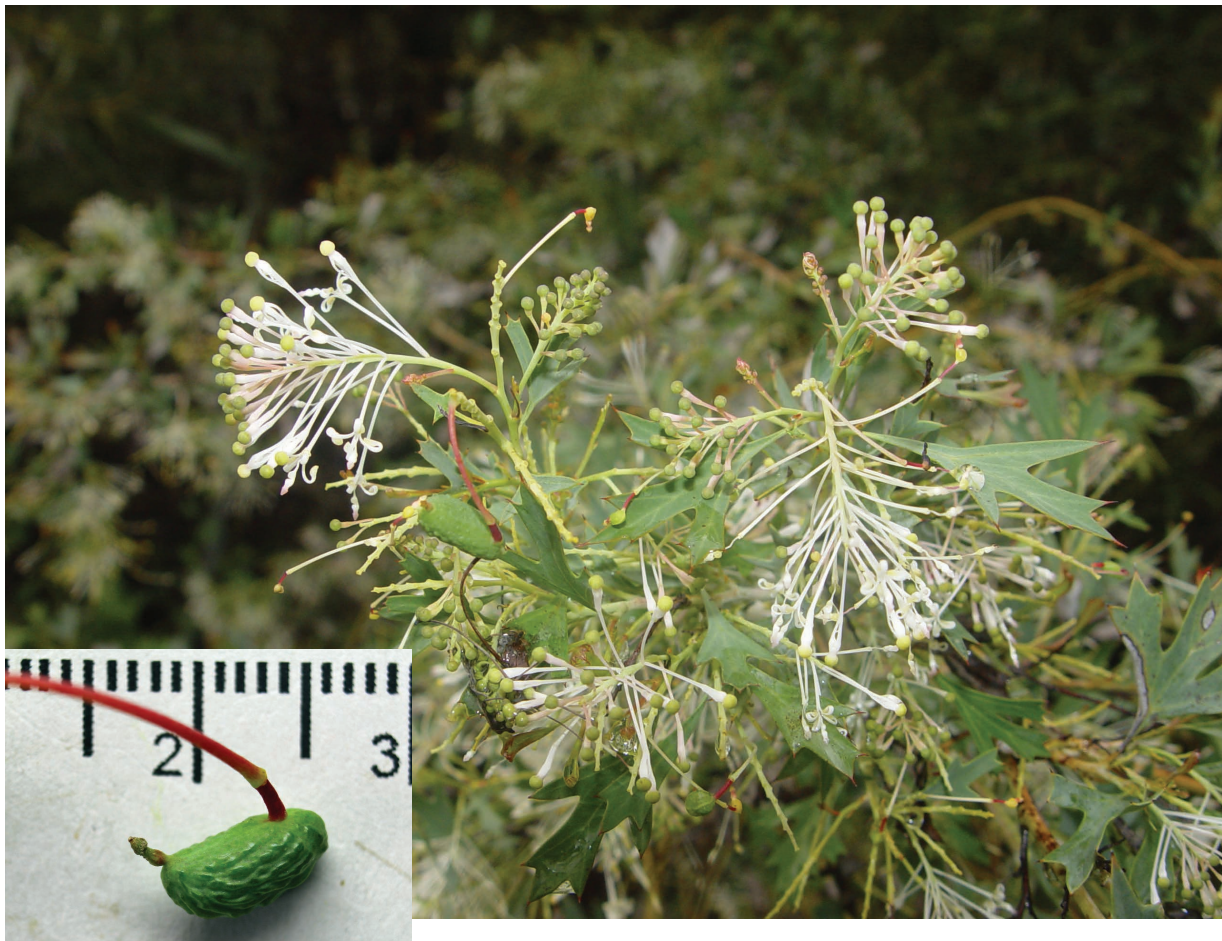


Fig. 2. Flowers and foliage of *Grevillea manglesii*. Photo: P. Olde. Inset: Follicle. Photo: M. Noake.

Should acceptance of Pépin’s description be successfully challenged as inadequate, the name of the species will not change but will revert to a process of linkage to *Anadenia manglesii* Graham. However, a change to the current authority would be needed to take account of an earlier combination. The revised authority would be *Grevillea manglesii* (Graham) A.Baumann and N.Baumann. Correspondence between Eugène Baumann on behalf of the Baumann brothers’ nursery is contained in Mangles Letter Books which explains their early access to plant introductions.

The link to Pépin's description was provided to the author in a communication dated 21 January 2021, by Professor David Mabberley. According to IPNI, Pépin is the author of eight published names, seven of which were published in the *Annales de flore et de Pomone*.

Anadenia manglesii Graham, *Edinburgh New Philosophical Journal* 27 (53): 189 (1839), as 'Manglesii'. Graham in Hook., *Icones Plantarum* 4: t. 337! (1841), *isonym*.

Grevillea manglesii (Graham) A. Baumann and N. Baumann, *Catalogue des végétaux en tous genres* 27 (1843); (Graham) T. J. Seidel, *Neue allgemeine deutsche Garten und Blumenzeitung* 2: 103 (1846), *isonym*; Planchon, *Hortus Donatensis* 96 (1858), *isonym*; McGillivray and Makinson, *Grevillea* 427 (1993), *isonym*. *Hakea manglesii* (Graham) Christenh. and Byng, *Global Flora* 4: 85 (2018), *nomen illeg.*

Type citation: [United Kingdom, Edinburgh, Scotland, cultivated]. 'We received this plant at the Botanic Garden, Edinburgh, from Mr Lowe [sic] of the Clapton nursery, in 1837, under the name of *Grevillea Manglesii*. The flowers are small but being very numerous, covering the whole plant, and remaining long in perfection, it is far from being destitute of beauty. It first came into flower in the greenhouse, under the ordinary treatment of New Holland plants, in March, and now (31st May), though the spikes of expanded flowers are clustered at the apex of every branch, there is a long succession of undeveloped buds.'

Neotype: (designated by McGillivray and Makinson 1993: 427) '*Anadenia manglesii* 25 July 1839, this name I have somewhere published it, but it was sent to me under the name of *Grevillea Manglesii*. It certainly is no *Grevillea*.' [R. Graham script] E00438973.

Note: McGillivray and Makinson (1993: 427) found that Graham did not preserve, annotate or date any specimens associated with his 'June' description. In proposing a neotype dated July, they discussed two other possibilities; two Drummond specimens at E annotated '*Anadenia manglesii*', which they noted were only indirectly implicated, and 'the plate' (discussed earlier). The Drummond specimens indeed are too indirect and uncertain a link, even though they could represent 'voucher' sources of the seeds germinated by Low or Robert Mangles. Their proposal to designate a cultivated specimen annotated by Graham as neotype is supported here.

SYNONYMS

Manglesia cuneata Endl. in Endlicher and Fenzl, *Novarum Stirpium Decades* 25 (1839), *nomen nudum*; Endl. ex Steud., *Nomenclator* ed 2, 2: 98 (1841), *nom. illeg. superfl. pro A. manglesii*. *Grevillea cuneata* (Endl.) Druce, *Bot. Soc. Exch. Club Brit. Isles* 4(5) Suppl. 2: 625 (1917), *nomen illeg.*

Grevillea manglesii Hort. ex Endl., *Novarum Stirpium Decades* 25 (1839), *nomen in syn.*; Steud., *Nomenclator Botanicus* ed. 2, 2: 705 (1841), *nomen nudum*; Heynhold, *Nomenclator botanicus hortensis* Vol. 2: 385 (1846), *nomen nudum*.

Grevillea manglesii J. B. Mackay ex Heynh., *Nomenclator* 368 (1840), as 'Manglesii', *nomen nudum*.

Manglesia glabrata Lindl., *Sketch Veg. Swan R.*: xxxvii (1840). *Grevillea glabrata* (Lindl.) Meisn., in Lehmann, *Pl. Preiss.* 1: 549 (1845), *nom. illeg. (A. manglesii in syn.)*.

Type: Not indicated.

Lectotype (designated here): [Western Australia] Swan River, *Drummond*, 1839 (CGE ex Hb. Lindley), specimen at left of sheet (see Fig. 3).

McGillivray and Makinson (1993: 427) have treated the lectotype as the holotype. There are a number of apparent duplicates of this collection, so even if the duplicates were not seen, the CGE specimen will not qualify as a holotype. The specimen at right mounted with the lectotype: Swan River, *Mr. Toward*, probably represents a 'voucher' source of the seeds germinated by Hugh Low or Robert Mangles i.e. *Grevillea manglesii* Hort ex Pépin. Toward never visited Australia but maintained an herbarium of the specimens under cultivation where he worked (see Loudon (1828b: 433) for an extended discussion).

McGillivray and Makinson (1993) also cited 'Neg. No. Kew 10531', suggesting that a photo of the lectotype is held at K. However, a search by Kew staff was unable to find it. Apparently this and similar Neg. numbers refer to sheets that were photographed at Kew, usually by request (in pre-scanning days). An alternate possibility is that this sheet is still actually held at K. A search of all specimens referable to *Grevillea* by Christine Bartram at CGE could not locate the lectotype, nor even a photo. However, there is a scanned photograph at the National Herbarium of NSW (not seen) and another in the Australian National Herbarium, Canberra, reproduced here.

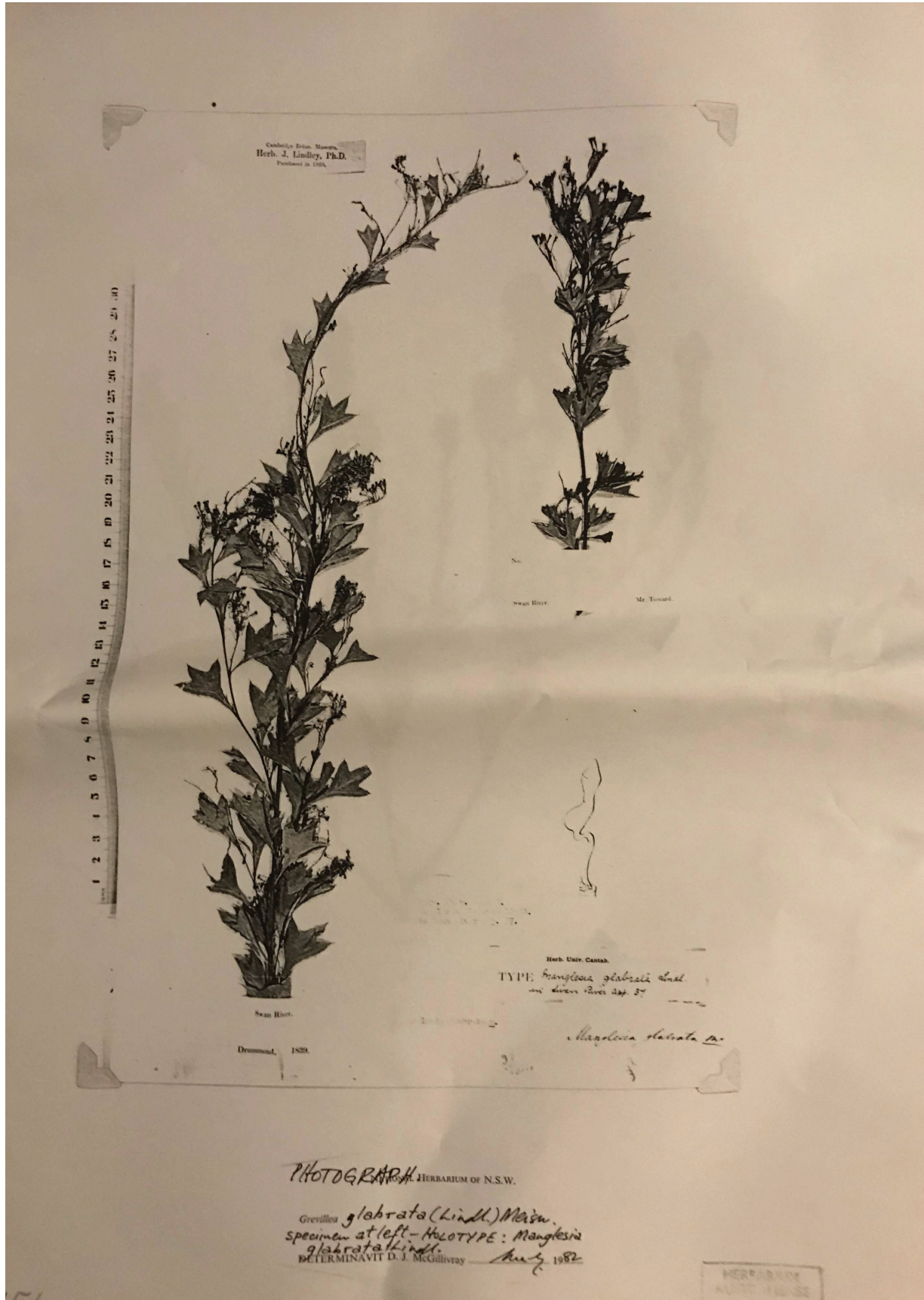


Fig. 3. Image (held at CANB) of lectotype of *Manglesia glabrata* Lindl.

Isolectotypes: ‘Communic. Lindley 1839’ [hand of Meisner] BR0000013460273; ‘Anadenia manglesii Graham in Hort. ic. t.337 [hand of R.Graham] ‘Swan River, Drummond’ [hand of ?Lindley] E00438974; ‘Manglesia glabrata, Swan River, Drummond No. 66’ [hand of ?Lindley] E00438975; ‘Swan River, Drummond’ (G-DC) G327722; ‘66 Swan River, Drummond’ [hand of Lindley] K1096609; Swan River, Drummond’ [hand of Lindley] K1096610; ?LE (*n.v.*); PERTH01000349 (photo).

Excluded specimens: ‘Drummond 1st Coll No. 621’ ?BM (not found); ‘621 Swan River Drummond [hand of Bentham] CGE12965 ex Hb. Lemann, specimen at right; ‘621’ [Drummond label] G389366; ‘Drummond 1. 621’ MEL64486; ‘Coll. 1 No 621 1843’ P02370471 ex BM, 13 April 1923, as *Hakea glabrata*.

The excluded specimens are from Drummond’s first collection *sensu* Hooker and were cited by McGillivray and Makinson (1993: 427) as ‘POSSIBLE PARTS OF THE TYPE COLLECTION’ of *Manglesia glabrata* Lindl. Numbered specimens from Drummond’s First Collection *sensu* Hooker, collected May 1842, were not distributed until 1843, well after the date of Lindley’s publication, *A Sketch of the vegetation of the Swan River Colony* (1839–1840), Before this time, most of Drummond’s specimens are un-numbered, although Erickson (1969: 168) asserts that numbered specimens were first sent by Drummond in November 1839 via the *Shepherd*, arriving in England presumably some time in December that year. Maslin and George (2005: 37) also point out that Drummond did number early specimens, at least from 1839. The number 66 associated with some specimens of *Manglesia glabrata* could represent such a number, even though it was sent in late 1838. However, these numbers are not the same as those traditionally accepted under Hooker’s numbering system which dates from 1842, when specimens were designated by Hooker as Coll. 1: and given a separate number in series. Most of the Drummond specimens utilised by Lindley appear to have arrived in April 1839 or earlier. A duplicate specimen of *Manglesia glabrata* was received at BM in July 1839.

? = *Manglesia trilobata* Hort. ex Ettingsh., *Denkschriften der Kaiserlichen Akademie der Wissenschaften, Mathematische-naturwissenschaftliche Klasse* 15: 181–272. 254, tab. 36, figs. 1–5 (1858).

Lectotype (here designated): [Illustration] Hort. ex Ettingsh., *loc. cit.*, Tab. 36, figs 1–5.

<https://www.biodiversitylibrary.org/page/6342869#page/371/mode/1up> (Fig. 4).

Herbarium specimens have not been found. Plants were cultivated at Schönbrunn Palace, Vienna (see Olde 2017: 310).

Bushy, sometimes virgate *shrubs* 1.5–2.5(–3) m high, 1.5–2.5 m wide with spreading to ascending branches, some from close to base. *Branchlets* cream to green, often glaucous. *Leaves* simple and divided; simple leaves (P2370475) *c.* 2 cm long, *c.* 5 mm maximum width, narrowly obovate, occasional to rare; divided leaves (1–)2.2–4(–5) cm long, (0.8–)2.5–4(–5) cm maximum width, with variable orders of division even on the same leaf, but always some leaves with secondary division, sometimes either obovate-cuneate with apical 3–5-lobing, or, most usually, trifid to pinnatifid with 3 (–7) deeply or shallowly divided primary lobes, the primary lobes often or all secondarily 2–3-fid, the basal primary lobes sometimes deeply dissected, dentate or bifid to trifid; *leaf rachis* straight or gently recurved; *ultimate leaf lobes of secondarily divided leaves* 0.3–3(–5) mm long, 3–8 mm wide, triangular, ascending to spreading; *central primary lobes* bi- or tri-fid with shallow incisions; *basal internode* rarely absent, 2–10 mm long, linear or very narrow-cuneate; *leaf base* truncate to broadly cuneate or cuneate; *adaxial surface* irregularly undulate; *texture* papyraceous to coriaceous.

Distribution: Western Australia. Grows in the Northern Jarrah Forest IBRA Subregion of the Jarrah Forest IBRA Region, in the Beverley and Perth Local Government Areas.

Phenology: Flowers from mid-winter (July) through spring to early summer.

Habitat and ecology: Grows mainly in wandoo or jarrah/marri forest and often with *Corymbia calophylla* (marri) in well-drained situations above drainage lines or watercourses, often in association with outcropping granite. Soils preferred are clay-loam or grey sand with laterite. Grows mainly in Proteaceae scrub in association with *Grevillea bipinnatifida*, *G. endlicheriana*, *G. hislopii*, *G. pilulifera*, *Hypocalymma angustifolium*, *Leptospermum erubescens*, *Synaphea acutiloba* and *Xanthorrhoea preissii*.

Conservation status: According to the Western Australian Herbarium, this species is Not Threatened.

Etymology: McGillivray and Makinson (1993: 427) have stated that the epithet is probably associated with Captain James Mangles, the man at the centre of seed distribution between 1834–1845, but in view of its horticultural history, it may actually be his older brother Robert Mangles (1781–1861) for whom it was named, probably by Low. However, firm evidence that Low coined the epithet is lacking and the author citation cannot include him.



Fig. 4. Lectotype of *Manglesia trilobata* Ettingsh. (Figs 1–5).

Specimens seen: Western Australia. Hort. bot. Vindobonensis, *Anon. s.n., s.d.*, (P750707 ex Hb Drake); Hort bot. Parisiensis, *Anon. s.n.*, May 1842 (P3354111); 4.5 km SW Carinyah, *R. Davis 4095*, 18 July 1997 (PERTH4811402); 2.3 km S of McCallum Rd on track c. 3km E of Watershed Rd. Gibbs State Forest Block, *G. Keighery 6797*, *N. Gibson*, 27 Sep 2000 (PERTH6823785); Wooroloo, *M. Koch 1518*, Nov 1906 (P2370475, PERTH01803581); Mundaring Weir, Darling Range, *P.M. Olde 86/277*, 6 Sep 1986 (NSW977404); Mt Observation, 59 km E of Perth towards York, *P.M. Olde 86/840*, 9 Oct 1986 (NSW977402); along exit road from Serpentine Dam car-park, Jarrahdale, *P.M. Olde 86/983*, 28 Oct 1986 (NSW977032); Brookton Highway, 10.9 km SE of Ashendon Rd., Canning Reservoir, *P.M. Olde 91/245*, 5 Oct 1991 (NSW362886); Measuring station via spur track off Reservoir Rd towards dam. *P.M. Olde 02/77*, *N. Marriott*, 5 Sep 2002 (NSW535252); Talbot Road Reserve, Talbot Rd., Swan View, *P.M. Olde 13/223*, 7 Sept 2013 (NSW); prope villam Harris ad fluvium Cygnorum, *L. Preiss 895*, July 1839 (P2370473 ex Hb Drake); Parkerville, Swan District, *E. Pritzel 49*, Nov 1900 (P2370477, PERTH01803603).

Grevillea dissectifolia (McGill.) Olde, **comb. et stat. nov.**

Basionym: *Grevillea glabrata* subsp. *dissectifolia* McGill., *New Names in Grevillea*: 6 (1986).

Type: [Western Australia] 11 km N of North Bannister on the Albany Highway, *D.J. McGillivray 3468*, & *A.S. George*, 23 Jun 1976 (holo: NSW621065 including packet; iso: K000799575 ex NSW; MEL2174176; NY (?distribuenti); PERTH01108700).

Bushy shrubs 2–2.5 m high 1.5–3 m wide with spreading branches. *Branchlets* usually red, at least sometimes non-glaucous. *Leaves* divided, 2–4.5 cm long, 2–6 cm wide, broadly ovate to obovate in gross outline, polymorphic, usually biternate, sometimes ternate with the lateral lobes secondarily bipartite, or rarely bipartite with the tripartite secondary division, or very rarely a few leaves simply tripartite or the central lobe with tertiary bifid division; *leaf rachis* smoothly recurved; *ultimate leaf lobes* 6–35 mm long, 2–4 mm wide, narrow-triangular or narrow-elliptic; *primary lobes* widely divergent to orthogonal; *central lobe* sub-divaricate; *basal internode* 13–22 mm long, linear to very narrow-cuneate; *adaxial surface of ultimate lobes* flat to angularly concave; *abaxial surfaces* narrowly exposed; *texture* papyraceous to coriaceous. (Figs 5–7).

Distribution: Western Australia, in the Northern Jarrah Forest IBRA Subregion of the Jarrah Forest IBRA Region in the Armadale, Beverley, Boddington, Mundaring, Murray, Wandering Local Government Areas according to Florabase (consulted 10 July 2021).

Phenology: Flowering commences May (in cult.) and continues densely or spasmodically at least until November. Fruits are usually present from October.

Habitat and ecology: Grows in Eucalypt forest (*Corymbia calophylla*, *Eucalyptus marginata*, *E. wandoo*, *E. patens*) or *Allocasuarina huegeliana* dominated woodland with *Xanthorrhoea preissii*, *Acacia pulchella*, *Grevillea* and *Hakea* spp. in moist situations or depressions in gravelly soils recorded as brown or yellow sand, loam or clay, sometimes in heavy laterite with exposed granite sheet or outcrops. Associated species in one location included *Eucalyptus decurva*, *Banksia armata*, *B. dallaneyi*, *Allocasuarina humilis*, *Grevillea cirsiifolia*, *G. bipinnatifida*, *Leucopogon* sp., *Pericalymma ellipticum*, *Stenanthemum nanum*, *S. pumilum*, *Jacksonia racemosa* and *Petrophile* sp. Additional species at a nearby site included *Hakea trifurcata*, *H. undulata*, *Banksia fraseri*, *Stirlingia simplex*, *Persoonia quinquenervis* and *Xanthorrhoea preissii*.

Conservation status: A conservation code of Priority Three has been designated by the Western Australian Herbarium. It occurs in several State Forests and Conservation Reserves, sometimes in large populations exceeding 1000.

Variation: Leaves vary from fine to coarse. The leaf division of *Hort 2098* is very coarse and its inclusion in *G. dissectifolia* is provisional. Most populations have not been seen in the wild and adjustments to the circumscription may become necessary.

Discussion: *Grevillea dissectifolia* differs from *G. manglesii* in its leaves never simple and entire v. occasionally simple; its leaves all deeply and similarly dissected v. some deeply and others (mainly in the distal half of the leaf) coarsely and irregularly divided; its primary lateral leaf lobes widely divergent to patent, rarely descending v. ascending to rarely spreading; the base of the primary central lobe of ternately divided leaves 1–2 mm wide, linear to very narrow-cuneate v. 3–5 mm wide, cuneate to broadly cuneate; all leaves with 2–3 primary lobes, bipartite with tripartite secondary division, or biternate with narrow lobes 7–20 mm long, 1.3–2.8 mm wide v. some leaves with 5–7 primary lobes, pinnatid to bipinnatifid, the secondary lobes if present triangular 0.1–5 mm long, 2–8 mm wide; leaves never secondarily triangular-toothed v. some or all leaves secondarily triangular-toothed.



Fig. 5. *Grevillea dissectifolia*, Williams Rd, Boddington. A. Flowering branchlets. B. Follicles and leaves. Photos: F. & J. Hort.



Fig. 6. *Grevillea dissectifolia*. Flowering branch. Photo: I. Gilmour.



Fig. 7. *Grevillea dissectifolia*. Natural population, Boddington. Voucher: Hort 3948. Photo: J. Hort.

Although the proximal lateral lobes of *G. manglesii* are also sometimes deeply cleft almost to the midvein, the distal lobes are always coarsely divided with shallow angular incisions or embayments. Leaf orders of division range from simple to once- and twice-divided often on the same plant, and the ultimate, secondarily divided lobes are short (0.3–1(–5) mm long) subtriangular, flat, and often crowded together, the central lobe is straight, flat and the primary venation is more generally ascending than for *G. dissectifolia* from which it is well distinguished and fully diagnosable. The leaves of *G. dissectifolia* are usually similarly and deeply twice-dissected, bear a distinct basal internode (0.1–)1–2.2 cm long. The ultimate lobes are 6–20 mm long, linear to narrow-triangular and with an angularly concave adaxial surface, the central lobe sub-divaricate and all lobes similarly wide-spreading to patent.

Grevillea dissectifolia is clearly distinct from *G. ornithopoda* which is a tall shrub to small tree 3–4 m high, has simple, narrowly elliptic leaves or once-divided, apically lobed leaves 5–8 cm long with a cuneate base, and lacking a basal internode.

Selected specimens examined: Western Australia: 31 mile Rd [c.20 km SE of Armadale], Gleneagle, R.J. Edmiston H738, 1969 (PERTH1035711); Metro Rd, North Bannister (Worsley lease), N. Eveleigh 63, 6 July 2007 (PERTH08001553); Watershed Rd., 0.9 km S of Schulstaad Rd, Leona SF, Beverley, F. Hort, B. Hort & R. Evans 2131, 26 Nov 2003 (PERTH06692850); Helena Valley Rd., 900 m E of Ridge Hill Rd, F. Hort 255, 18 Oct 1998 (PERTH05299551); Metro Rd, Gibbs SF, Wandering, F. Hort 476 & L. Robson, 12 May 1999 (CANB527379, NSW498646, NSW520118, PERTH05311667); McCallum Rd, Gibbs SF, Beverley, F. Hort 477 & L. Robson, 13 May 1999 (CANB527380; PERTH05311675); Metro Rd, 4.5 km S of Division Track, then 800 m directly SE, F & J. Hort 501, 29 May 1999 (PERTH05369371); Monadnocks Conservation Park A39826, Millars Log Rd, 2.3 km E of Albany Hwy, Wandering, F & B. Hort 2098, 13 Nov 2003 (MEL, PERTH06692192); Serpentine River Crossing, Boonering SF, Williams Rd, Boddington, F & J. Hort FH3712, 11 Sept 2011 (CANB, PERTH08359776); Williams Rd, Boonering SF, Boddington, F. Hort FH3948 & J. Hort, 3 Sep 2015 (MEL2409455, PERTH8699968); Big Brook crossing, Forest Dept Reserve, Dwellingup, P.C. Kimber 227, 2 Sep 1966 (PERTH02118335); 11 km N of North Bannister on the Albany Highway, D.J. McGillivray 3471 & A.S. George, 23 June 1976 (NSW; PERTH01803395); Albany Highway, 28.9 km SW of Jarrahdale Rd, P.M. Olde 86/986, 28 Oct 1986 (NSW977134); S.E.C. N.T. 81 Powerline, Dwellingup District, J.L. Robson JLR650, 8 Nov 1996 (PERTH04865227); Youraling SF, C. Tauss s.n., Aug 2004 (PERTH08011559).

Grevillea ornithopoda Meisn. in Lehm., *Pl. Preiss.* 2: 256 (1848).

Grevillea manglesii subsp. *ornithopoda* (Meisn.) McGill., in McGillivray and Makinson, *Grevillea*: 427 (1993).

Grevillea glabrata subsp. *ornithopoda* (Meisn.) McGill., *New Names in Grevillea*: 6 (1986).

Hakea ornithopoda (Meisn.) Christenh. and Byng, *Global Flora* 4: 87 (2018).

Type: [Western Australia] Swan River, Drummond. coll. II. No. 314.

Lectotype designated by McGillivray and Makinson (1993: 427): ‘*Drummond n. 314!* in hb. Shuttl.’ [Meisner script] NY 00284671.

Isolectotypes: ‘No. 314 *Grevillea ornithopoda*, Meisn W. Australia Drummond 2nd collection 1844’ A00035409 ex BM; ‘leg. J. Drummond’ B_10_0279551 ex MEL, as *Diels* 7583; ‘314’ [Drummond handwritten label] BM001121157; ‘314, Swan River, Drummond’ CGE12984 ex Hb. Lemann; E00438972 ex BM; G389365; ‘Swan R, J. Drummond 2nd ser No.314’ K000579576 ex Hb. W. Saunders, presented by the Linnean Society 1915; K000599577 - whole sheet; ‘S.W. Australia, Drummond 314’ K000799579 -specimen at right of sheet; ‘Swan River J. Drummond no. 314. /bis/’ [J. G. Agardh’s hand] LD1742676; ‘Swan River J. Drummond no 314. bis’ [J. G. Agardh’s hand] LD1742356; ‘314’ [Drummond label] ‘II 314 *Grevillea ornithopoda* Meisn., Ad fl. Cygnorum leg. J. Drummond’ LE00011506 ex Herb. Hort. Petropolitani; MEL65474; NY00284672; P00750730; P00750731 ex BM, reçu 13 April 1923; PERTH01057936 ex MEL.

Probable isolectotypes ‘Drummond 6’ K000599578 - Kew Neg No. 2347; ‘*J. Drummond 9 or 6*’ MEL2174868. These specimens were possibly part of a set sent by Drummond to Hooker, prior to the major despatch.

Description: (Meisner 1848: 256) here translated: *Grevillea* (Manglesia) *ornithopoda* C.F. Meisner a completely glabrous plant, the leaves wedge-shaped, long attenuate-subpetiolate, flat, three-nerved, the apex trifid, the lobes subequal, narrowly lanceolate, entire, with a spiny mucro, the lateral lobes recurved-subfalcate; the racemes pedunculate, branched lower down; style filiform at base.]

Virgate shrubs or small trees (2–)3–5 m high, 1.5–2 m wide, with ascending branches. Branchlets cream. Leaves simple and divided; simple leaves 3–6 cm long, 2.5–4(–5) mm maximum width, narrow-obovate; divided leaves 5–8 cm long, 10–25 mm maximum width, obovate-cuneate, apically bi- or tri-partite with triangular lobes

from deep or shallow angular incisions; *leaf rachis* straight; *leaf lobes* 8–22(–33) mm long, 2–4 mm wide, subtriangular, ascending; *basal internode* absent, the distance from petiole attachment to the proximal vein sinus usually c. 30 mm; *adaxial surface of ultimate lobes* flat; texture papyraceous. (Fig. 8).



Fig. 8. *Grevillea ornithopoda* in cultivation, Oakdale, New South Wales. Photo: P. Olde.

Distribution: Western Australia. It occurs in the Northern Jarrah Forest and Swan Coastal plain IBRA Subregion of the Jarrah Forest IBRA Region, in the Mundaring, Murray, Perth, Serpentine-Jarrahdale, Waroona Local Government Areas.

Phenology: Flowers from late autumn through to late spring.

Habitat and ecology: Grows in open, often degraded *Eucalyptus rudis* forest in sandy gravelly loam beside watercourses and drainage lines of the Murray River. Recorded associated species include *Corymbia calophylla*, *Acacia pulchella*, *Jacksonia sternbergiana*, *Dodonaea viscosa*, *Melaleuca raphiophylla*, *Astartea affinis*.

Conservation status: A conservation code of Priority Two has been designated by the Western Australian Herbarium.

Etymology: The epithet is derived from the Greek, ‘*ornithos*’ a bird, and ‘*podon*’ a foot, in reference to the leaves, shaped like those of a bird’s foot.

Discussion: *Grevillea ornithopoda* appears closely related to *G. manglesii* Pépin, but it is not here held to be the same species, most particularly in the absence of phylogenetic testing and scientific analysis. Now extremely rare in its natural habitat, its populations maintain, without intergrading with *G. manglesii*, a distinctive leaf morphology and a more tree-like habit. The leaves are obovate-cuneate, apically toothed and lack secondary division. Simple, narrow-elliptic leaves are also frequent. Differing orders of leaf division at the population level are held here to be significant in the recognition of species at that rank as originally proposed by Meisner (1848).

Selected specimens examined: Western Australia: Helena River, near Mundaring, C.A. Gardner 549, 11 June 1920 (PERTH01070150); Murray River, Pinjarra, R. Helms s.n., 23 Sept 1897 (NSW125519, PERTH01070142); Little Yunderup Island, G. Keighery 16138, 15 Nov 2000 (PERTH06097375); Lane Poole Reserve, Dwellingup, M.L. Mallie 104 & W. Birmingham, 5 Apr 2017 (PERTH09197540); Jarrahdale, A. Morrison 765, Oct 1901 (PERTH01070576); Meelon Nature Reserve, SW of Pinjarra, P.M. Olde 01/142 & N. Marriott, 11 Sept 2001 (NSW535103).

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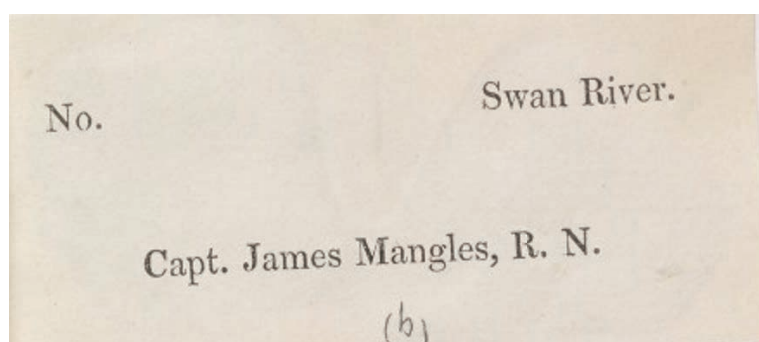


Fig. 9. Printed label for James Mangles specimens.

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