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Grevillea tesselata Olde (Proteaceae: Grevilleoideae: Hakeinae), a rare new species of uncertain affinity from the Avon Wheatbelt region of south-west Western Australia

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Abstract

Grevillea tesselata Olde is described here as a new species from south-west Western Australia, known only from a small population in a fragmented roadside landscape, and previously recognised under the phrase name *Grevillea* sp. Trayning (W. Johnston WJ 071). Following the *Flora of Australia*, the new species keys to the *Grevillea Acacioides* Group which comprises only three species, *G. endlicheriana* Meisn., *G. acacioides* C.A.Gardner ex McGill. and *G. gordoniana* C.A.Gardner. A binary assessment of 50 morphological characters presented here supports the view that *G. acacioides* and *G. endlicheriana* are sister species. A key to the new species is provided and its distribution updated. *Grevillea tesselata* has a Priority One Conservation Code according to the Western Australian Herbarium.

Introduction

An unusual *Grevillea* was first collected in the Trayning area in the Avon Wheatbelt region of south-west Western Australia (*W. Johnston WJ 071*, PERTH) in December 2006. The collection was subsequently recognised as a distinct taxon under the phrase name *Grevillea* sp. Trayning (W. Johnston WJ 071) by Mike Hislop and bought to the attention of the author. Subsequent searches have made additional collections from the original locality, but not located any additional populations. The author has been investigating a significant number of *Grevillea* populations in southern Western Australia that do not readily conform to recognised species (Olde 2020, 2021a–c, 2022; Olde & Marriott 2021; Olde & Keighery 2022), and as part of this work, *Grevillea* sp. Trayning (W. Johnston WJ 071) is here described as a new species, *Grevillea tesselata* Olde. The new species keys to the Acacioides group of *Flora of Australia* (Makinson 2000), so its relationships are considered relative to this group.

McGillivray and Makinson (1993: 382) first treated *Grevillea endlicheriana* Meisn., *G. acacioides* C.A.Gardner ex McGill. and *G. gordoniana* C.A.Gardner as an informal group because they share isobilateral or terete leaves, a spongy pericarp that tightly encloses the seed, and winged seeds. The same species were similarly grouped together in the key by Olde and Marriott (1994), and then informally identified as the '*Acacioides* Group' by Makinson (2000). However, after sampling two out of these three species (*G. endlicheriana* and

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G. gordoniana), a phylogenetic analysis using four plastid and one nuclear DNA regions identified that the Group was polyphyletic (Mast *et al.* 2015). A closer examination by the authors of that study identified that three morphological character states of *G. endlicheriana* were shared by *G. acacioides*, which was not included in the study, but not shared by the distantly related *G. gordoniana.* These are: retrorse ovaries, a spongy pericarp that tightly encloses the seed, and mature fruits with a persistent dorsal ridge of gynoecial tissue remaining fully or partially excurrent.

These results suggest that the relationship between *Grevillea endlicheriana* and the new species recognised here, *G. tesselata*, also requires investigation. As the new species was not included in the molecular study of Mast *et al.* (2015), the relationship between this new taxon and the group is further explored here using analysis of morphological data based on characters considered diagnostic for species in this group.

Materials and methods

The four-species 'Group' was examined here by a binary assessment of morphological similarity (The Simple Matching Distance *sensu* Sneath and Sokal 1973), to determine whether the new species should be included in the *Acacioides* Group. A matrix of asymmetric attributes in which 0 is more important than 1 was established (Table 1) based on the descriptions of *G. endlicheriana* (and *G. filifolia* Meisn.) provided by Meisner (1845: 546–547), Bentham (1870: 474), McGillivray and Makinson (1993: 385), Olde and Marriott (1995a: 143–145) and Makinson (2000: 189), a study of herbarium specimens at NSW and PERTH, a study of plants in the wild, and experience with cultivated plants over several decades. Morphological characters in the descriptions considered important to each species' concept were identified and 50 were listed individually for comparison. The characters defining *G. endlicheriana* were all allotted a score of 0 at the appropriate coordinate. Similarity of this attribute in the other three species was also scored with 0. Differences were scored as 1. Characters shared by all species were eliminated as uninformative. Overall similarity was then assessed by comparing the number of shared derived character states for each species. The criterion for similarity and hence inferred close relationship (the highest score) was arbitrarily determined as a Distance Coefficient of > 0.75, which allowed for a moderately large number of potential autapomorphies in the species examined.

Results and conclusions

The distance coefficient for both *G. tesselata* and *G. gordoniana* was assessed as too low to meet the similarity criterion. This is consistent with the published phylogenetic analysis of subtribe Hakeinae Endl. that resolved *G. gordoniana* as part of separate clade, rather than as sister to *G. endlicheriana* (Mast *et al.* 2015).

Table 1. Matrix of asymmetric morphological attributes in the *Grevillea* Acacioides Group for assessment of relationships in which 0 is weighted as more important than 1.

Attribute	Character	Scoring	Species			
			endlicheriana	*acacioides*	*tesselata*	*gordoniana*
habit	regeneration modes	resprout = 0; non-resprout = 1	0	0	1	1
branchlets	shape	angular = 0; round = 1	0	1	1	1
leaves	division	always simple = 0; sometimes divided = 1	0	0	1	1
	ribbing	with ribs = 0; smooth = 1	0	0	1	1
	type	similifacial = 0, not = 1	0	1	1	1
	apices	non-pungent = 0; pungent = 1	0	1	1	1
conflorescence	development	basipetal = 0; acropetal = 1	0	0	1	0
	aggregation	multi-branched = 0; simple–2-branched = 1	0	1	1	0
	prominence	emergent = 0; enclosed = 1	0	1	1	0
peduncle	colour	not rusty = 0; rusty =1	0	0	1	1
	presence	present = 0; absent to very short = 1	0	1	0	0
rachis	cf. peduncle	concolorous = 0; discolorous = 1	0	0	1	0
common bracts	type	fleshy = 0; papery=1	0	0	0	1
	prominence	inconspicuous = 0; conspicuous = 1	0	1	0	1

Attribute	Character	Scoring	Species			
			endlicheriana	*acacioides*	*tesselata*	*gordoniana*
pedicels	indumentum	glabrous = 0; hairy = 1	0	0	1	0
torus	shape (in polar view)	regular = 0; not regular = 1	0	0	1	0
	width	< 1.4 mm = 0; >1.4 mm = 1	0	0	1	1
nectary	visibility above toral rim	prominent = 0; obscure =1	0	0	1	1
	shape	semi-annular = 0; long U-shape = 1	0	0	1	1
	margin	toothed = 0; smooth=1	0	0	1	1
pistil	length	< 13 mm = 0; > 13 mm = 1	0	0	1	1
gynophore	length at anthesis	< 2 mm long = 0; > 2 mm = 1	0	0	1	1
	insertion	vertical = 0; oblique = 1,	0	0	1	1
carpel	orientation	retrorse = 0; not retrorse = 1	0	0	1	1
style	papillae	usually present = 0; never present = 1	0	0	1	0
pollen-presenter	shape	round = 0; not round = 1	0	0	1	1
	obliquity	>45° = 0; <45° = 1	0	1	0	1
perianth	abaxial surface	glabrous = 0; hairy =1	0	0	1	0
	hairs on adaxial surface condensed into a beard	yes = 0; no = 1	0	0	1	0
tepals	tepal-limbs	mid-line ribbed = 0; not midline ribbed = 1	0	0	1	1
fruit	gynoecial tissue	partly excurrent = 0; not excurrent = 1	0	0	1	1
	lateral compression	uncompressed = 0; noticeably compressed = 1	0	1	0	0
	persistence	quickly deciduous = 0; persistent = 1	0	0	1	1
	usual colour	anthocyanins present = 0; never = 1	0	1	1	1
	dorsal shape	concave = 0; straight =1	0	0	1	1
	attachment	lateral on dorsal side = 0; basifixed = 1	0	0	1	1
	shape	obloid-ventricose = 0; other = 1	0	0	0	1
	glandular exudate	absent = 0; present = 1	0	1	0	1
	pericarp surface	not ridged = 0; transversely ridged = 1	0	1	0	0
follicular valves	discoherence at anthesis	fully discoherent = 0; along the ventral suture only = 1	0	0	1	1
	detachment	differential = 0; conjoined = 1	0	0	1	1
mesocarp	texture	foveolate = 0; crustaceous = 1	0	0	1	1
	shape of seed cavity	different to pericarp = 0; same as pericarp = 1	0	0	1	1
	thickening	marked = 0; moderate = 1	0	0	1	1
	transverse sub-basal funicular groove	present = 0; absent = 1	0	0	1	1
endocarp	texture	smooth = 0; flaky = 1	0	0	1	0
seed	adaxial surface	channelled with raised lateral borders = 0; not channelled = 1	0	0	1	0
	exposure of adaxial surface	partly hidden by border = 0; fully exposed = 1	0	0	1	0
	shape	linear-oblong = 0; obovoid = 1	0	0	1	0
	enclosure	tightly enclosed = 0; not tightly enclosed = 1	0	0	1	1
		Unshared characters		12	42	34

Grevillea acacioides shared 38 of the 50 scored characters with *G. endlicheriana,* a distance coefficient (d) of 0.76, whereas *G. gordoniana* shared 16 (d = 0.32) and *G. tesselata* only 9 (d = 0.18). The high level of overall morphological similarity between *G. acacioides* and *G. endlicheriana*, indicates a close relationship and is consistent with results found by Mast *et al*. (2015). The numerical results justify continued recognition of the '*Acacioides*' Group with membership reduced to two species, *G. acacioides* and *G. endlicheriana*, at least until more information can be obtained on their relationships. In this analysis, *G. tesselata* had the lowest score of morphological similarity. Since Mast *et al.* (2015) resolved *G. gordoniana* in a clade separate from *G. endlicheriana*, it seems reasonable that *G. tesselata* should likewise be excluded until results of a whole of genus molecular phylogeny is produced. This analysis does not exclude or confirm a close relationship between *G. gordoniana* and *G. tesselata*. Accordingly, *G. tesselata,* which had the lowest distance co-efficient relative to *G. endlicheriana*, is here treated as a species of uncertain affinity.

Revised Key to Groups

Amendments to the Key to Groups and the Key to Species *sensu* Olde and Marriott (1994: 189–221) are given here.

29 Nectary prominent, semi-annular with recurved margin, not adnate to the inner face of the torus; torus not invaginated; ovary retrorse; fruits with axial gynoecial tissue wholly or partly excurrent over its entire length; fruit attachment dorsal; leaves simple..... Group 17 (*Acacioides* Group)

29* Nectary obscure, long U- or V-shaped, adnate to the inner face of the torus; torus invaginated; ovary not retrorse; fruits with axial gynoecial tissue partly concurrent; fruit attachment basal; leaves simple and divided

29A Leaves terete

29B Leaves without grooves on adaxial surface; conflorescences multi-branched, emergent, imbricate; fruits obloid-sigmoid and string bean-like, the exocarp viscid, with resinous exudate; pedicels and perianth glabrous outside ..... Group 17a (*G. gordoniana*)

29B* Leaves 1-grooved on the adaxial surface; conflorescences simple to 1-branched, enclosed, not imbricate; fruits ellipsoid, the exocarp shiny non viscid, ultimately tessellated; pedicels and perianth sparsely hairy outside..... Group 17b (*G. tesselata)*

29A* Leaves not terete

Taxonomy

Grevillea tesselata Olde, **sp. nov.**

Type: Western Australia: [precise locality withheld], W of Trayning. 31°1'20.5"S, 117°37'53.3"E, GDA 94, *M. Hislop* 3743, 15 Dec 2007 (*holo*: PERTH 07695667; *iso*: AD, CANB, K, MEL, NSW 536134).

Grevillea sp. Trayning (W. Johnston WJ 071), Western Australian Herbarium (1998 onwards), https://florabase.dpaw.wa.gov.au/browse/profile/31212 (accessed 2 May 2022)

Bushy, seed-obligate, weakly serotinous *shrubs* 2–2.5 m high, 3–4 m wide; branches ascending to spreading. *Branchlets* erect to slightly spreading, slightly flexuous, often forked distally, terete, densely sericeous, the hairs *c*. 0.25 mm long, biramous with mostly ferruginous contents. *Leaves* (30–)45–105 mm long, (1.1–)1.3–1.5 mm diameter, erect to ascending, sessile to shortly petiolate, simple, rarely bipartite with secondary bipartite division of one lobe, subterete to slightly compressed laterally, most slightly incurved, some straight, not crowded, concolorous, the surface smooth except for a medially grooved longitudinal rib on the adaxial side, sometimes also shallowly channelled on either or both sides of the rib, the surface with irregular longitudinal wrinkling when dry, the wrinkles not formed into a continuous rib; *petioles* scarcely distinguishable; *base* narrowly attenuate; *apex* acute, terminated by a necrotic, straight or slightly curved, pungent spine 1.25–1.5(–2.8) mm long; surface of young leaves with a dense ferruginous indumentum of appressed, short trichomes *c*. 0.05 mm long, of mature leaves the hairs white, mostly evanescent, appressed, the surface soon glabrous, the hairs mostly *c*. 0.2 mm long, biramous, appressed, minute hairs not evident; *venation* obscure; *texture* stiffly coriaceous. *Conflorescences* acropetal, terminal or subterminal on short branches, simple or 1-branched, pedunculate, enclosed within the foliage; *simple conflorescences* erect, regular, subglobose to umbelloid, 20–30-flowered; *conflorescence buds* 3 mm long, 2.25 mm wide, ovoid, not imbricate; *peduncles* (5–)8–10 mm

long, ferrugineus-sericeous, usually with one or two bud-like outgrowths above the distal leaf; *inflorescence rachis* 8–12 mm long, 0.8 mm thick, white-sericeous, the hairs biramous; rachis extension 0.5–1 mm long, oblique, triangular or sometimes withered, subcaudate; *peduncular bracts* (when present) solitary, 3 mm long, *c*. 1–1.5 mm wide, oblong-cymbiform, apiculate; *involucral bracts* 2–2.5 mm long, 2 mm wide, ovate-apiculate, the abaxial surface rusty-sericeous with prominent raised central rib, some hairs glandular and with minute resinous deposits evident; *common bracts c*. 1.5 mm long, 1 mm wide, ovate to obovate or elliptical, apiculate, the abaxial surface sparsely white-sericeous, soon glabrous-ciliate, caducous when buds are *c*. 1.25 mm long; *bractiform leaves* 2.5 mm long 1.75–2 mm wide at base, ovate apiculate with defined raised midrib, the apiculum *c*. 0.5 mm long, the abaxial surface densely sericeous, the hairs ferruginous with some scattered white hairs. *Flowers* zygomorphic, adaxially oriented, dichromatic *in vivo*, green in bud, the abaxial surface of the perianth cream at anthesis, the adaxial surface white; style pink at base green to greenish white elsewhere prior to anthesis, whitish-cream after anthesis, entomophilous, scent not recorded; *pedicels* 3–4 mm long, 0.25 mm wide at mid-point, 0.3 mm wide distally, terete but abruptly expanded below the torus with pronounced dorsal attenuation, a dense to sparse indumentum of biramous, appressed, white hairs *c*. 0.3 mm long proximally, the hairs becoming sparse distally, scattered erect glandular hairs sometimes intermixed; *torus* oblique at *c*. 45°–60°, 1.5 mm across, irregularly oblong-elliptic, truncate ventrally, attenuate dorsally, cupuliform; *nectary* long V- to U-shaped, lining the inner surface of the torus, only the margin extending above and over the toral rim, 0.1–0.2 mm thick, erect; *pistils* 16–17 mm long, glabrous; *gynophore* 2.5–3 mm long, 0.2–0.3 mm wide, angularly inserted, adnate to the dorsal surface of the invaginated torus for *c*. 0.5 mm, refracted ± orthogonally just below the toral rim (realigned roughly parallel to the pedicel); *ovary* 0.7 mm long, 1.0 mm wide, oblong-elliptic to subglobose, lateral, conspicuous, the base truncate to ascending, not retrorse; *style* 0.3 mm diameter, cream in the proximal half, greenish distally, smooth, exserted before anthesis, hooked subapically; *style-end c*. 0.3 mm wide, terminated in the distal half on the back of the pollen-presenter; *pollen-presenter* 1.8 mm long, 1.0–1.2 mm wide, *c*. 0.1 mm thick, green, lateral to very oblique at *c*. 80°, oblong to oblong-elliptic with rounded corners, the surface flat, the margin undulate, thin; stigma slightly raised, central to distally off-centre; *perianth* 4.5–5.0 mm long, 1.25 mm wide, the tube oblong-triangular without basal dilation, persistent, the abaxial surface openly sericeous in young bud, the hairs mostly evanescent, scattered appressed hairs retained near the base and on the limb at anthesis, the adaxial surface glabrous at base, densely papillose and loosely pilose from *c*. 2.0 mm above the torus to the curve, the indumentum situated mostly adjacent to and above the level of the ovary but not condensed into a dense beard, the papillae minute, the trichomes (0.2–)0.7–1.0 mm long, unbranched, robust, straight to slightly flexuous with acute tip; perianth limb *c*. 2.0 mm across, depressed-globose to cushion-like, dorsiventrally compressed, tightly revolute in the distal quarter, with scattered appressed biramous hairs and usually with numerous short erect glandular hairs intermixed, concolorous *in sicco*; *dorsal tepals* 9.5–12 mm long, 0.5–0.8 mm wide, narrow-ovoid; *ventral tepals c*. 6.5 mm long 1.25 mm wide at base, ovoid; *tepals* each with a prominently raised longitudinal mid-rib below the limb on the abaxial surface, grooved on the adaxial surface, the rib forming the axis of angular tepal infraction, attached at base directly to the outer margin of the toral rim, ontogenetically first separating along the dorsal suture, everting and all tepals separating from each other to base before anthesis, the adaxial surface conspicuously exposed; *tepal-limbs* remaining strongly coherent, ultimately all free and loose at anthesis, not recoiled. *Fruits* 10–12 mm long, 8–10 mm wide, 7 mm thick, erect to antrorsely oblique with attachment posterior-basal, the ventral suture adaxially oriented, dispermous, usually persistent, tightly enclosing the seed body, obovoid-globose, green when young ageing black, soon greyish black, the *follicle valves* thick-walled, remaining coherent after dehiscence along the dorsal suture and at base, very slightly compressed, detaching when ripe with pedicel attached; axial tissue of the gynoecium above the gynophore and below the fruiting style concurrent; fruiting style obliquely subterminal on the dorsal side of pericarp, fragile; *pericarp* 1.75– 2 mm thick at the suture, 0.6–1.0 mm thick at centre-face, 1.4–1.6 mm thick at the dorsal side; *exocarp c*. 0.1 mm thick at the suture, discolorous, smooth to colliculose or obscurely verrucose or rugulose, shiny, tessellated with age, not transversely ridged, non-viscid; *mesocarp* 1.25–1.5 mm thick at the suture, with a hard outer zone *c*. 1 mm thick, consisting of white, stone-like intrusions and a softer inner surface *c*. 0.5 mm wide, discolorous with pebble-like texture; *surface of the suture* grooved and with papyraceous deposits on the ventral suture; *endocarp c*. 0.2 mm thick, black, rugose, ultimately flaky, differing markedly in texture from the mesocarp, broadly concave and roughly coursing the outline of the exocarp; *texture* bony. *Seeds* (*ADC 2353*) 9 mm long, 4 mm wide, peripterous; *seed body* 8 mm long, 2.7 mm wide, 1 mm thick, obovate, acute and slightly compressed at the micropyle end, obtuse at the chalaza end; *abaxial surface* convex, without secondary development, smooth, mottled with scaly particles, *adaxial surface* 7 mm long, 1.8 mm wide, linear, very slightly convex, flat for 0.8mm at the triangular apex, with a smooth, raised membranaceous rim *c*. 0.25 mm wide around the margin, surface smooth; *seed wing* 0.5–1.2 mm wide, fragile, membranaceous; *elaiosome* absent; *raphe* sub-basal, conspicuous; *hilum* obscure. (Figs 1–3)

Fig. 1. *Grevillea tesselata* Olde (drawn from *Hislop 3743*). **a**. Habit with fruit. **b**. Style-end close-up. **c**. Flower post anthesis. **d**. Conflorescence bud. **e.** Flower before anthesis. **f**. Perianth limb close-up. **g.** Nectary and stipe lining the torus. **h**. Flower section showing zygomorphic torus, ovary orientation. **i**. Fruit: ventral view showing basal attachment. **j, k**. Seed (above and below). **l.** Fruit: side view with tesselated exocarp and concurrent gynoecial tissue × 4. **m.** Fruit: internal side view × 4. Scale bar: **a** = 40 mm; **b, d, g, h** = 4 mm; **c, e** = 6 mm; **f** = 2 mm; **i–m** = 15 mm. Illustration by Lesley Elkan.

Fig. 2. *Grevillea tesselata*. A. Conflorescence. B. Plant habit with serotinous fruits. Photos: A by Phil Lewis; B by Peter Olde.

Fig. 3. Fruit capsules and seeds. A. *Grevillea tesselata*. B. *Grevillea acacioides*. C. *Grevillea endlicheriana*. Photos: A, B. by Peter Olde; C by Mark Noake.

Diagnostic characters: Similar to *Grevillea acacioides* due to the regular dome-shaped conflorescences and adaxially oriented flowers, but differing in its leaves with a single rib, usually longer, occasionally divided, its conflorescences 20–30-flowered, acropetal, its peduncles longer (8–10 mm long), ferruginous, its rachises longer (8–12 mm long), sericeous, its common bracts glabrous-ciliate, not imbricate, its torus dorsally attenuate, cupuliform, its nectary obscure, its pedicels shorter (3–4 mm long) and sparsely sericeous, its perianth sparsely sericeous on the outside, pilose inside, the hairs longer, not condensed into a beard, the limb minutely glandular, the limb segments not ribbed, its pistils longer (*c.* 16 mm long), its gynophore longer, its carpel not retrorse, its pollen-presenter sublateral, wider and longer and un-rimmed; its fruits ellipsoidal, connected at the base and coherent after anthesis, the exocarp tessellated, not transversely costate, the mesocarp not spongy, the obovate seeds convex on the adaxial surface, not partially enclosed by a revolute margin.

Distribution: Western Australia, South-west Botanical Province, in the Katanning, Merredin Subregion of the Avon Wheatbelt IBRA Region ABRA 5.1, Trayning Shire.

Habitat and ecology: Occurs in slight depressions of an otherwise flat plain in open acacia-eucalypt woodland with *Melaleuca uncinata,* and chenopods in pale, sandy saline clay-loam with some laterite. Associated species recorded on specimen labels include *Acacia* sp., *Cassytha* sp., *Daviesia nematophylla*, *Enchylaena tomentosa*, *Eremophila drummondii*, *E. oppositifolia*, *Eucalyptus salmonophloia*, *Grevillea acuaria*, *G. hakeoides* subsp. *stenophylla*, *G. hookeriana*, *G. huegelii*, *G. paniculata*, *Hakea recurva*, *Maireana* sp., *Melaleuca acuminata*, *M.* ?*lanceolata, M. pauperiflora* subsp. *fastigiata, Olearia* sp. and *Santalum* sp.

Selected specimens seen (10 examined): WESTERN AUSTRALIA: [precise locality withheld, all from the same location], W. of Trayning, *A. Crawford ADC 2353,* undated [2013] (NSW, PERTH); *M. Hislop 3744*, 15 Dec 2007 (PERTH 07695659, NSW 536133); *W. Johnston WJ 071*, Dec 2006 (PERTH); *N. Marriott 1023*, 17 Sep 2010 (MEL, NSW871898); *P.M. Olde 13/400 & F. & J. Hort*, 9 Sep 2013 (NSW, PERTH, distribuendi).

Phenology: Flowers in late spring–summer with fruits forming from mid-January.

Conservation status: Currently listed as Priority One under Western Australian Conservation Codes (Western Australian Herbarium 1998–). This species should be considered for listing as Critically Endangered due to its extremely limited distribution and number of individuals. *Grevillea tesselata* was discovered in December 2006 and is confined to a single population fragmented within a relatively short length of disturbed road verge. A few plants have regenerated beside the disused, rail-line running parallel to the road. The population consists of less than 50 individual plants and is clearly threatened at the species level.

Etymology: From the Latin *tesselatus* (tessellated), a reference to the crazed exocarp of this species that is visible soon after fruit dehiscence.

Notes: *Grevillea gordoniana* differs from *G. tesselata* by its sub-arborescent habit, its longer, non-grooved, terete leaves 15–36 cm long, in its emergent, multi-branched conflorescences, imbricate in bud and developing basipetally, its inflorescence rachises, perianth and pedicels glabrous, its gynophore longer (2.3–2.6 mm long), its fruits longer (23–28 mm long) and sigmoid-ellipsoid to obovoid in shape, the exocarp viscid, rugose, ultimately with resinous deposits, its seeds linear with wing attenuated at each end.

Grevillea acacioides differs in its leaves always simple, crowded, usually shorter, mostly straight, subterete, multi-ribbed *c.* 0.8 mm wide diam. (up to 1.75 mm wide in some specimens with leaves elliptic in cross-section); its conflorescences 8–16-flowered, conspicuously imbricate with basipetal development; its peduncles white-sericeous to white-tomentose; its inflorescence rachises tomentose to villous, often with glandular hairs intermixed; its common bracts absent; its involucral bracts 2–5 mm wide; its pedicels longer (4–7.5 mm long), and glabrous; its perianth glabrous on the abaxial surface, the hairs on the adaxial surface curled or sinuous

and condensed into a beard, the tepal-limbs with a prominent mid-rib; its torus oblique at *c.* 30°, but narrower (0.8–1.1 mm across), subregular, not dorsally attenuated, not cupuliform; its nectary prominent, semi-annular to broadly U- or V-shaped, lobed at each end; its pistils shorter (10–12.5 mm long); its ovary retrorse; its gynophore 1–1.3 mm long, vertically inserted, not lining the inside of the torus and infracted at its rim, its pollen-presenter smaller, oblique at *c.* 30°, oblong to round, conical, 0.7–1.2 mm long, 0.6–1.0 mm wide, 0.2–0.4 mm high, surrounded by a thin collar of style-end tissue and attached to the style-end on its dorsal side in the proximal half; its fruits sub-ellipsoidal with a shallow embayment on the dorsal side, deciduous, the valves dis-coherent after dehiscence and falling separately, the gynophore lateral, excurrent, detached from the pedicel before falling, the abaxial surface dull, brown or creamy, rugose with smooth undulations and with a raised, transverse band across the abaxial surface of each valve in the proximal half, the mesocarp thick, spongy; its seeds smaller, linear to narrow-elliptic, the adaxial surface deeply channelled with conspicuous raphe and hilum, on the abaxial surface abruptly convex beyond a low-profile elliptic terminus 0.8 mm long.

Grevillea endlicheriana differs in its lignotuberous habit, its polymorphic leaves always simple, terete or sometimes dorsiventral with tri-ribbed abaxial surface, its emergent, multi-branched conflorescences, the development of the whole conflorescence and each unit conflorescence basipetal, its peduncles secondarily branched, often angular, white-sericeous, its pedicels glabrous, its torus transverse to slightly oblique, not dorsally attenuate, its perianth glabrous on the abaxial surface, its fruits red when young, transversely attached to the dorsal suture but otherwise similar in shape to those of *G. acacioides*.

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