



Grevillea hortiorum Olde (Proteaceae: Grevilleoideae: Hakeinae), an uncommon species from winter-damp woodlands in the Avon Wheatbelt, south-west Western Australia

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Abstract

Grevillea hortiorum Olde is here described as a new species. It is a member of the *Triloba* Group *sensu* Flora of Australia, based on shared morphological characters, and it may be related to *Grevillea acrobotrya* Meisn. Numerous morphological differences distinguish it as a species, but its relationships have not been tested with phylogenetic data. Subsequent to its initial discovery, when it was thought to be rare, both its distribution and knowledge of populations have been greatly expanded, almost exclusively due to the efforts of its eponymous collectors. It was initially thought to be uncommon and associated with open wandoo woodland, but later collections have been gathered in open heath as well. An interim key to *Grevillea hortiorum* is provided.

Introduction

Grevillea hortiorum Olde is a new member of the *Triloba* Group *sensu* Makinson (2000), Group One *sensu* Olde & Marriott (1994), a moderately large entomophilous group of species, the size of which is being rapidly increased by new discoveries (e.g. Olde 2020). The *Triloba* Group can be characterised by its actinomorphic perianths, the tepals of which first separate below the limb, then at anthesis curl down before dis-cohering separately, by its thread-like, usually elongate pedicels, its pre-anthetic, antrorsely folded gynophore, its pistils contracted above the ovary and below an abrupt stylar dilation that tapers into the style-end, and by its erect, pollen-presenter. Two members of the *Triloba* Group (*G. acrobotrya* and *G. anethifolia*) included in a molecular phylogeny were unsurprisingly found by Mast *et al.* (2015) to be sister to each other. Together they are sister to two species in Group 8, *sensu* Olde & Marriott, the closest of which is *G. dielsiana* C.A.Gardner. However, all four were resolved in a large heterogeneous clade with species from 20 other morphological groups *sensu* Olde & Marriott, including *Finschia* Warb. Infra-clade relationships require further analysis, which will necessitate sampling of a greater number of species and utilising a larger set of molecular markers. The *Triloba* Group is presently under revision and as new species are recognised, genetic material is being added to existing datasets for further analysis. A full key to the Group will be provided when all currently known species are described, but an interim key is provided here. Terminology follows McGillivray and Makinson (1993); Olde and Marriott (1994); and Olde (2020).

The documentation of rare flora and discovery of undescribed plant and insect species in many genera near Perth has been an invaluable contribution, over many years, of retired teacher-lecturers, Fred Hort and wife Jean, to natural history science. Using their own initiative, they studied aerial photos of the region around Perth, then targeted search areas in which the vegetation appeared different from surrounding areas. This simple but effective approach has yielded numerous undescribed plant species and extended the ranges of many others (e.g. Thiele 2010, 2019; Obbens 2012; Hislop 2013).

Interim key to distinguish *Grevillea hortiorum* from other species in the *Triloba* Group

- 1 Fruits smooth; perianth limb reddish-brown or chocolate
- 2 Foliage dimorphic, the under-surface of vegetative leaves exposed;
pollen-presenter fusiform *G. acrobotrya*
- 2* Foliage monomorphic; the under-surface of all leaves enclosed by margins;
pollen-presenter conical..... *G. hortiorum*
- 1* Fruits not smooth; perianth limb lemon to yellow..... See Makinson (2000: 415–419)

As noted above, a revised key to the remainder of the *Triloba* group is required, but many additional taxa are likely to be recognised, so provision of a full key to species is considered premature.

Taxonomy

Grevillea hortiorum Olde, *sp. nov.*

Type: Western Australia: Gunapin Ridge Road, Gunapin State Forest, west of York, *F. Hort* 308, 18 Nov 1998 (holo: PERTH 5235421; iso: CANB 511311, *n.v.*).

Diagnosis: Similar to *G. acrobotrya* Meisn., but differing in its leaves unimorphic, deeply dissected with the leaf under-surface enclosed by margins, not dimorphic with basal vegetative leaves obovate-cuneate and the under-surface exposed; common bracts longer (1–1.2 mm vs 0.5–0.9 mm), floral rachises longer (15–17 mm vs 9–13 mm long), pedicels longer (11–12.5 vs 5–9 mm long); more conspicuous stylar dilation; pollen-presenter wider at base than the style-end vs fusiform.

Grevillea sp. Gunapin (F. Hort 308), in Western Australian Herbarium (1998–). <https://florabase.dpaw.wa.gov.au/browse/profile/18635> (accessed 28 Nov. 2020)

Seedlings not seen. Mature plant an erect, open, somewhat fastigiate, seed-obligate, stenobasic *shrub* 1.7–3 m high, 1–1.3 m wide, branching low to the ground from a smooth, grey trunk, sometimes bushy at the base with weakly emergent floral branches. *Branchlets* 1–2 mm thick, slender, greenish to yellowish-white, angular, usually with numerous fine longitudinal ribs decurrent from the petioles, glabrous, glaucous to caesious, rarely white sericeo-tomentose with a mixture of evanescent, appressed and ascending hairs of medium length; floral branches virgate with few side branches. *Adult leaves* divided, 1–3 cm long, 1–3 cm wide, polymorphic, ovate in gross outline, usually crowded, ascending to spreading, shortly petiolate, with primary and secondary orders of division, usually bi- or divaricately tri-5-sect, often biternate; leaves on floral branches not reduced in size; new growth light green, usually sericeous, with short evanescent white hairs, sometimes glabrous; *basal internode* 3.5–4.5(–8) mm long, 0.5–0.8 mm wide, monomorphic, linear, trigonous in cross-section; glabrous; *primary lobes* 3, spreading; *terminal and central lobes* similar; *ultimate leaf lobes* 0.5–1(–2.1) cm long, 0.5–0.8 mm wide, spreading, linear-subulate, trigonous to ellipsoid in cross-section, straight, the lobes often unequal; *apices of lobes* attenuate, spinescent, pungent; *spine* 1.2–2 mm long, necrotic with brown base, straight; *margins* smoothly to slightly angularly revolute; *adaxial surface* flat to slightly convex, smooth, sometimes channelled beside the obscure to prominent midvein, mostly glabrous or with scattered appressed biramous hairs; *abaxial surface* bisulcate, the lamina obscured by margins, glabrous or with a few scattered biramous hairs on the prominent midvein; *sulcae* 0.03–0.05 mm wide, packed with straight hairs; *texture* coriaceous; *petioles* 1–2 mm long, 1.2 mm wide, glabrous, normal, most scarcely wider than the leaf base, 3-merous, the central segment dominant but without extension down the branchlet, lateral segments closely aligned and poorly developed, the adaxial surface concave. *Conflorescences* simple or branched, glabrous except the bracts with ciliate margins, terminal, subterminal, occasionally a few axillary, sessile to very shortly pedunculate, scarcely to not exceeding the subtending leaf lobes; *terminal and subterminal conflorescences* simple to 5-branched; *axillary conflorescences* simple; *unit conflorescences* 2–2.5 cm long, 2 cm wide, subglobose to shortly cylindrical, 18–22 flowered; *buds* not seen; *peduncles* 0–2 mm

long; *floral rachises* 15–17 mm long, the apex without obvious vegetative extension, erect, usually straight, stout at base with distal tapering; *rachis nodes* prominent; *peduncular bracts* absent; *involucral bracts* not seen; *common bracts* 1–1.2 mm long, 0.3 mm wide, linear-lanceolate, caducous at early bud stage. *Flower colour*: Perianth and pedicels white, the perianth limb often greenish but becoming ultimately reddish-chocolate; pollen white. *Flowers* acroscopic, scarcely to not nectariferous, fragrant, entomophilous, glabrous except where noted; *pedicels* white, 11–12.5 mm long, ascending to strongly erect; *basal pedicels* 11–12.5 mm long, *distal pedicels* 12–12.5 mm long; *torus* 0.5 mm across, oblique at 30–45°; *nectary* evident, angularly V-shaped, rising 0.1–0.15 mm above torus, margin entire. *Pistil* 4–4.5 mm long; *gynophore* 1.5–1.8 mm long, antrorsely folded before anthesis; *ovary* 0.5–0.65 mm long, 0.6–0.7 mm wide, lateral, round to broadly ellipsoid with truncated base sometimes slightly compressed laterally, remaining smooth after fertilisation; *style* constricted above the ovary, then swollen; *stylar constriction* 0.2–0.25 mm long, 0.2 mm wide, incurved or straight; *stylar swelling* 1.5–1.7 mm long, 0.3–0.4 mm maximum width, before tapering gradually below the style-end to 0.25–0.3 mm; *pollen-presenter* 0.65–0.7 mm long, narrowly ampulliform-conical; *base* 0.4–0.5 mm wide, abruptly divergent from the style-end, slightly oblique and sometimes irregular, not rimmed; *stigma* c. 0.15 mm wide, transverse. *Perianth* 3.5 mm long, 0.4–1 mm wide, actinomorphic; *perianth tube* 2 mm long, 0.7 mm wide, narrowly obovoid, contracting slightly just below the limb; *limb* 1.2 mm long, 1.5–1.7 mm wide, broadly ellipsoidal to round, usually the apex depressed; *tepals* 4 mm long, 0.7 mm maximum width, 0.5 mm wide below the limb; *abaxial surface* faintly to prominently ribbed; *adaxial surface* smooth; *tepal-limbs* 1.2 mm long, 1 mm wide, with prominent midrib. *Fruits* follicular, monospermous, 8–10 mm long, 4–6 mm wide, oblong-ellipsoidal, transverse to very oblique on incurved gynophore, with attachment subposterior, 2–3 mm from base; *persistent style* lateral, oblique with pollen-presenter conical; *pericarp* 0.5 mm thick along the suture, the thickness \pm uniform throughout; *exocarp* smooth to slightly colliculose; *mesocarp* crustaceous; *endocarp* smooth, membranaceous.

Summary of diagnostic characters: *Grevillea hortiorum* is distinguished by the following combination of characters: stenobasic, weakly dimorphic habit, bushy at base with emergent, slender floral branches; branchlets usually glabrous, glaucous; leaves monomorphic, divaricately lobed with primary and/or secondary orders of division; leaf lobes spreading, subulate, \pm uniform throughout, the abaxial surface not exposed; common bracts early caducous; pedicels 11–12.5 mm long; pistils glabrous, 4–4.5 mm long, with distinct stylar dilation; pollen-presenter not fusiform, slightly bulbous-conical, its base wider than the style; perianth glabrous, actinomorphic with chocolate globose limb; exocarp smooth to slightly colliculate.

Distribution: Western Australia, where known from a few scattered locations west of York and near Bindoon. It occurs in the Northam, Toodyay and York LGAs in the Avon Wheatbelt P2 and Northern Jarrah Forest IBRA Subregions of the Avon Wheatbelt and Jarrah Forest IBRA Regions.

Phenology: Flowering occurs from late winter to spring. Fruiting period: late spring

Habitat and ecology: Grows in wandoo or marri open woodland or in open winter-damp heath or thick scrub surrounded by woodland, on white or brown granite sand, clay-loam either combined with or over laterite. Recorded in association with a range of Proteaceae and other genera, including *Adenanthos cygnorum*, *Allocasuarina humilis*, *Banksia armata*, mallee *Eucalyptus* spp., *Grevillea bipinnatifida*, *G. scabra*, *G. pilulifera*, *Hakea gilbertii*, *H. incrassata*, *H. undulata*, *Hibbertia hypericoides*, *Isopogon divergens*, *Lasiopetalum exiguum*, *Petrophile ericifolia*, *P. striata* and *Xanthorrhoea preissii*.

Conservation status: *G. hortiorum* is known from several populations, some small, on disturbed roadsides and in natural bushland. Recently discovered populations near Bindoon contain thousands of plants and there does not appear to be an immediate conservation imperative. Several populations occur in designated Nature Reserves.

Etymology: Named for Frederick D. Hort (4 July 1937–) and frequent field companion, TAFE lecturer and amateur nature photographer, Jean L. Hort (née Boyle) (8 Feb 1952–). Before his retirement, Fred Hort was principal of Mt. Helena Primary School and had a keen interest in orchids and photography. Both have been dedicated volunteers at PERTH and their boundless enthusiasm for collecting and plant hunting has resulted in the discovery of this and several other previously unknown plant species.

Variation: Two specimens of *G. hortiorum* have been collected from plants with hairy branchlets. The specimen (*F. Hort* 1139) occurred on a disturbed roadside verge with three other plants of the same species bearing glabrous, glaucous branches. It was destroyed by roadworks in September 2001. The second (*Olde* 06/01 & *F. Hort*) was collected in an anthropogenically undisturbed population. In both cases no closely related species could be found nearby from which a hybridisation event could be inferred. Equally the specimens appear to have no population base. Accordingly, they are here treated as unexplained genetic variants without taxonomic significance.

Discussion: *Grevillea hortiorum* is similar to *G. acrobotrya* in its dimorphic habit, and in its flowers with similar reddish-chocolate perianth-limb. *Grevillea acrobotrya* differs however in its dimorphic habit, its leaves polymorphic, the vegetative leaves spreading, petiolate, non-pungent, obovate-cuneate, the margins dentate, and with the abaxial surface clearly exposed, the leaves on emergent floral branches erect, sessile and close-appressed to the branchlet, pungent, reduced in size with deeply sect-division, mostly trisect with the abaxial surface enclosed by margins. All leaves of *G. hortiorum* are similar, with trisect division and the under-surface enclosed by tightly revolute margins. *G. acrobotrya* also has shorter common bracts (< 1 mm long), shorter pedicels (5–9 mm long), and generally shorter pistils (3–3.5)–4 mm long) with a scarcely dilated style and fusiform pollen-presenter (i.e. the style-end and the base of the pollen-presenter merge seamlessly with only slight dilation). *Grevillea roycei* McGill. has similar glabrous, glaucous branchlets to *G. hortiorum* but differs in the shape of its pollen-presenter which is broader at the base than its height, and in its retrorse stem-clasping, basal leaf lobes and in its lemon-yellow perianth limb. *Grevillea levis* Olde & Marriott might also be confused. It differs from *G. hortiorum* in its unimorphic habit, its leaves with the basal internode 5–7 mm long, its ultimate leaf lobes 0.5–2 (–4) cm long, its common bracts 0.5 mm long, its perianth limb lemon to yellow, its pedicels 5–7 mm long. At the type locality *G. levis* is rhizomatous but is elsewhere not always so. *Grevillea levis* is currently under revision and further taxa may be identified.

Specimens examined: WESTERN AUSTRALIA: Gunapin State Forest, West York, *F. Hort 234a*, 21 Sep 1998 (PERTH); Wambyn Rd., Northam, *F. Hort 1136*, 21 Sep 2000 (PERTH); Mokine Nature Reserve, Northam, *F. Hort 1135*, 21 Sep 2000 (PERTH); Boyercutty Road, York, *F. Hort 1138*, 21 Sep 2000 (CANB, PERTH); Qualen Rd., West York, *F. Hort 459a*, 7 May 1998 (PERTH); Mokine Road, York, *F. Hort 1139*, 21 Sep 2000 (PERTH, CANB); Julimar Proposed Conservation Park, Munyerring Block, Toodyay: in the NE cnr of Munyerring, 31°22'30" S 116°18'32" E, *F. Hort 2679* & *B. Hort. s.n.*, 2 Nov 2005 (PERTH); Bindoon Training Area, Toodyay, c. 1 km ESE of Teds Crossing track, *F. Hort 2703*, 13 Nov 2005 (PERTH); Bindoon Training Area, 6.6–7.2 km SE–E from Artillery Road along the southern boundary, *F. Hort 2673* *J. Hort* & *B. Hort*, 6 & 21 Oct 2005 (PERTH); Southern boundary of Bindoon Army Training Area, 6.6–7.7 km E from Artillery Rd., *P. Olde 06/01* & *F. Hort*, 21 Jun 2006 (NSW, PERTH); Qualen Rd., West York, *P.M. Olde 99/153a* & *N.R. Marriott*, 21 Oct 1999 (NSW); Gunapin Forest Block, Gunapin Ridge Rd., West York, *P.M. Olde 99/154* & *N.R. Marriott*, 21 Oct 1999 (NSW); Munyerring Spring Road North, beside Bindoon Army fence, Toodyay West, *P.M. Olde 15/47*, *K. Alcock*, *F.* & *J. Hort*, 15 Aug 2015 (NSW).



Fig. 1. *Grevillea hortiorum* with tiny native bee pollinator hovering. Photo: F. & J. Hort.

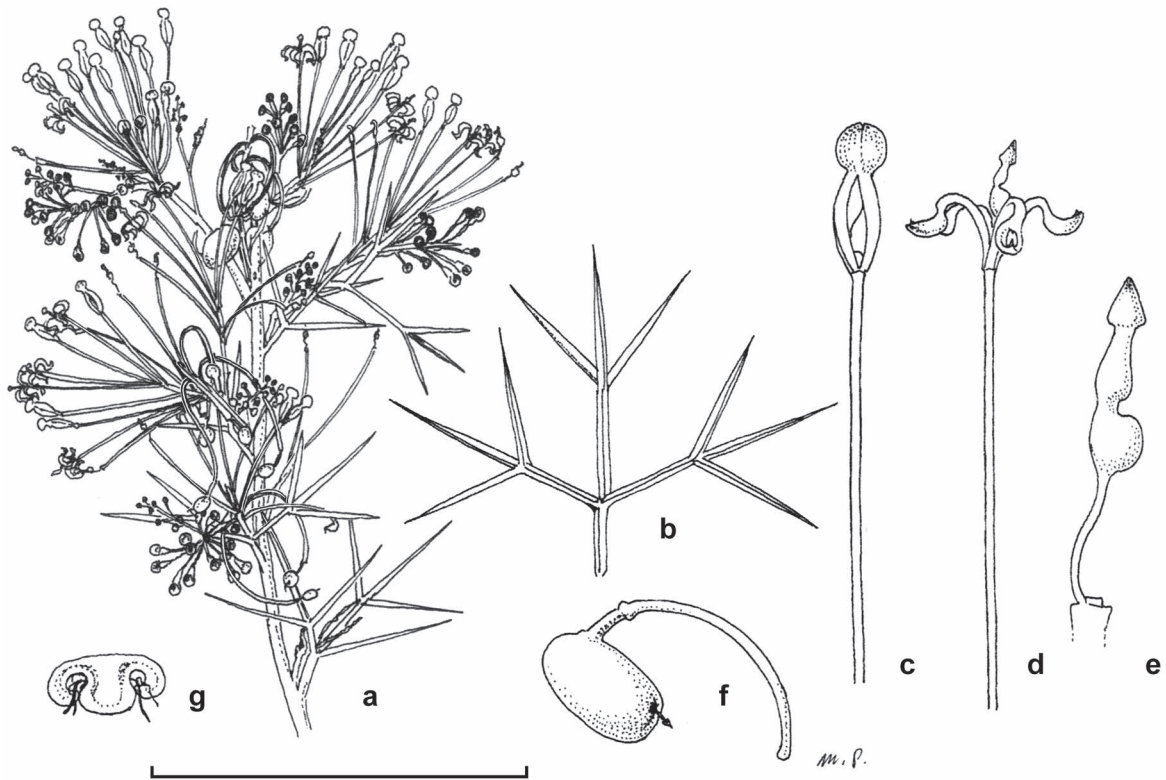


Fig 2. *Grevillea hortiorum*. a. habit; b. leaf; c. flower bud before anthesis; d. flower after anthesis; e. pistil. F. fruit; g. leaf cross-section. Scale bar: a = 50 mm; b, f = 25 mm; c, d = 12.5 mm; e = 6.25 mm; g = 2.5 mm. Illustration by M. Pieroni from material provided by F. & J. Hort.



Fig 3. *Grevillea hortiorum* in natural habitat. Photo J. & F. Hort.

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