Darwinia hortiorum (Myrtaceae: Chamelaucieae), a new species from the Darling Range, Western Australia

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Abstract

Thiele, K.R. *Darwinia hortiorum* (Myrtaceae: Chamelaucieae), a new species from the Darling Range, Western Australia. *Nuytsia* 20: 277–281 (2010). The distinctive, new, rare species *Darwinia hortiorum* is described, illustrated and discussed. Uniquely in the genus it has strongly curved-zygomorphic flowers with the sigmoid styles arranged so that they group towards the centre of the head-like inflorescences.

Introduction

Darwinia Rudge comprises *c*. 90 species, mostly from the south-west of Western Australia with *c*. 15 species in New South Wales, Victoria and South Australia. Phylogenetic analyses (M. Barrett, unpublished) have shown that the genus is polyphyletic, with distinct eastern and western Australian clades. Along with the related genera *Actinodium* Schauer, *Chamelaucium* Desf., *Homoranthus* A.Cunn. ex Schauer and *Pileanthus* Labill., the *Darwinia* clades are nested in a paraphyletic *Verticordia* DC.

Many undescribed species of *Darwinia* are known in Western Australia, and these are being progressively described (Rye 1983; Marchant & Keighery 1980; Marchant 1984; Keighery & Marchant 2002; Keighery 2009). A significant number of taxa in the genus are narrowly endemic or rare and are of high conservation significance. Although taxonomic reassignment of the Western Australian species of *Darwinia* may be required in the future, resolving the status of these undescribed species and describing them under their current genus helps provide information for conservation assessments and survey.

Darwinia hortiorum K.R.Thiele was first collected by Fred and Jean Hort in 2008 from granite outcrops in the Monadnocks Conservation Park and adjacent Boonering State Forest. It is clearly distinct from any known taxon, and is described here as new.

Taxonomy

Darwinia hortiorum K.R.Thiele, *sp. nov.*

Species floribus valde curvatis zygomorphicis, stylis sigmoideis a congeneribus diversa.

Typus: Monadnocks Conservation Park [precise locality withheld for conservation reasons], Western Australia, 15 November 2009, *F. Hort* 3525 *& K. Thiele* (*holo*: PERTH08243832; *iso*: CANB, MEL, NSW, K).

Darwinia sp. Wandering (F. Hort 3273), Western Australian Herbarium, in *FloraBase*, http://florabase.calm.wa.gov.au [accessed 20 July 2010]

Erect to spreading, densely branched, rather compact, glabrous *shrubs* to 70 cm tall and to 80 cm wide, single-stemmed at the base with spreading main branches bearing numerous, ascending, leafy branchlets; young stems pale, with corrugate-corky, decurrent ridges extending for several nodes below each leaf insertion; bark on older stems reddish-brown, papery, decorticating in flakes. *Leaves* alternate, widely spreading, ± triquetrous, narrowly ovate to almost linear, 3–6 mm long, *c*. 1 mm wide, with a petiole *c*. 0.3 mm long; adaxial surface dark green, flat, nerveless, with obscure, sunken, pale oil glands tending to form a row each side of the midline; abaxial surface paler, keeled by a prominent, thickened midrib, with obscure, sunken, pale, scattered oil glands; margins entire or minutely, irregularly denticulate, with a very narrow, hyaline border; apex hyaline-acuminate but not pungent. *Inflorescences* erect, terminal to seasonal growth units (which continue to grow shortly after flowering), comprising 14–18(–22) pedunculate, 2-bracteolate flowers each in the axil of a bract, the apex vegetative and growing on shortly after flowering; inflorescence bracts slightly longer and wider than the leaves but otherwise similar; peduncles of the lowermost flowers 1.5–3.5 mm long, upper ones successively shorter; bracteoles broadly ovate, obtuse, with or without a soft, terminal apiculum, connate for the lowermost 1/4–1/3, closely enveloping the base of the hypanthium, *c*. 4 mm long (extending to the base of the sepals), scarious, pale brown with a darker, keeled midrib, with scattered translucent oil glands towards the apex. *Hypanthium* deeply 5-grooved, curved, 3.5–4 mm long, smooth, glossy reddish-brown paler at the base; *sepals c*. 3 mm long, erect (closely appressed to the petals), obtuse, thick, fleshy, dark green with pale, scarious margins, warty with scattered, prominent, pale oil glands; *petals* 2–3 mm long, those facing the centre of the inflorescence shorter than those opposite so that the corolla is curved-zygomorphic, incurved-erect, obtuse, thick, fleshy (similar in texture to the sepals), pale yellowish or suffused with crimson, smooth, glossy, with few, embedded oil glands. *Stamens* 10; anthers globose, *c*. 0.3 mm long, on filaments 0.8–1.5 mm long, protruding between the petals after anthesis; staminodes ovate, obtuse, *c*. 0.6 mm long, largely free from the stamens. *Style* distinctly sigmoid, the free portion curved so that the styles group towards the centre of the inflorescence, pale greenish to pale pink; substigmatic hairs *c*. 0.25 mm long, in a band *c*. 0.5 mm long immediately below the minute stigma, covered in oil and pollen at anthesis. *Mature fruits* not seen. (Figure 1)

Other specimens examined.WESTERN AUSTRALIA (all PERTH): [precise localities withheld for conservation reasons] Boonering State Forest, 23 Aug. 2008, *F. Hort* 3212 *& J. Hort*; Boonering State Forest, 23 Sep. 2008, *F. Hort* 3273; Boonering State Forest, 2 Nov. 2009, *F. Hort* 3514; Monadnocks Conservation Park, 15 Nov. 2009, *F. Hort* 3526 *& J. Hort*.

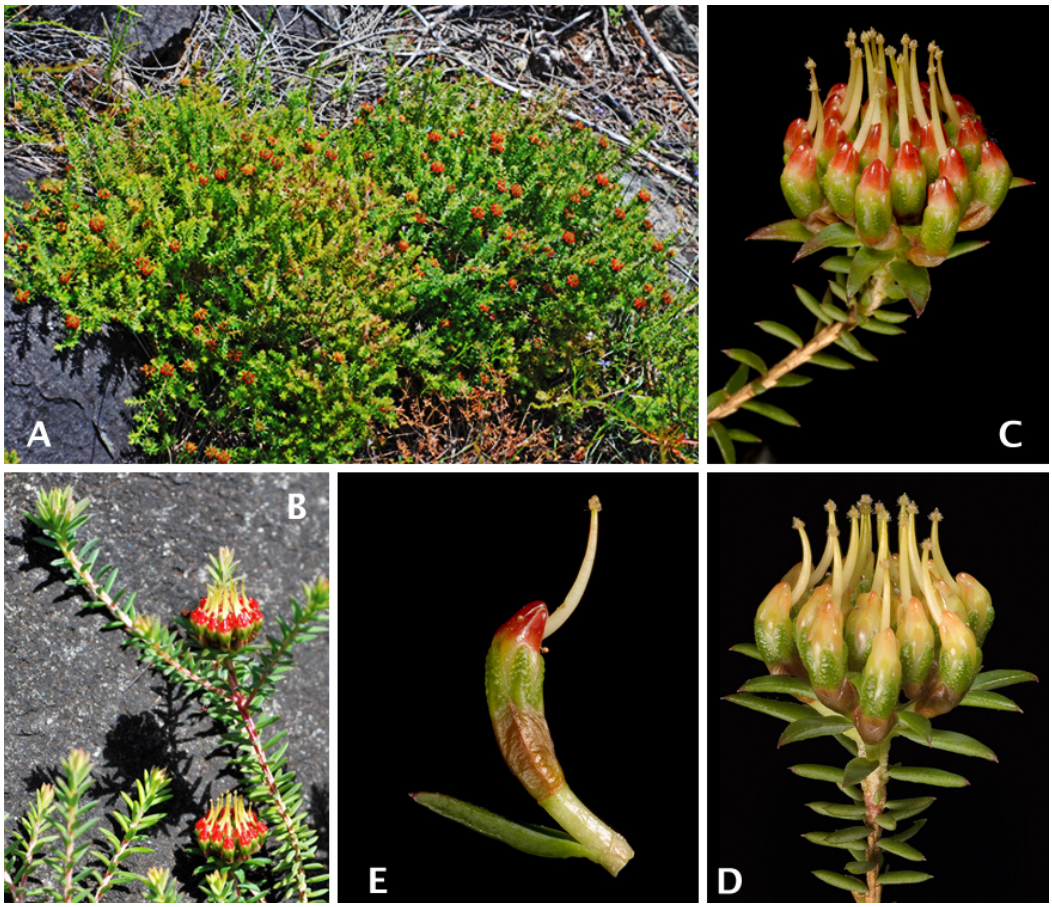

Figure 1. *Darwinia hortiorum*. A – individual shrub; B – flowering branchlets; C, D – inflorescences (C – red-flowered variant; D – yellow-flowered variant); E – individual flower of the red-flowered variant. Photographers: A, B – J. Hort; C, D, E – K.Thiele.

Distribution. Currently known from five localities in the Jarrah Forest IBRA Bioregion (Department of the Environment, Water, Heritage and the Arts 2008), in an area *c*. 3 × 3 km in the Monadnocks Conservation Park and adjacent Boonering State Forest (Figure 2).

Habitat. All known populations are found in jarrah forest growing in association with large granite outcrops and their drainage lines. Close to the outcrops the plants are usually found growing in shallow granitic soil with broken stone fringing the main outcrops. On drainage lines more distant from outcrops the plants are found growing in loam or loam/clay soil associated with laterite. Characteristic associated species include *Allocasuarina humilis*, *Andersonia* spp., *Grevillea bipinnatifida*, *G. manglesii*, *Banksia recurvistylis*, *Hakea undulata*, *H. trifurcata*, *Verticordia insignis*, *Calytrix depressa*, *Xanthorrhoea preissii* and *Hibbertia hypericoides*.

Phenology. Flowers from late September to early December.

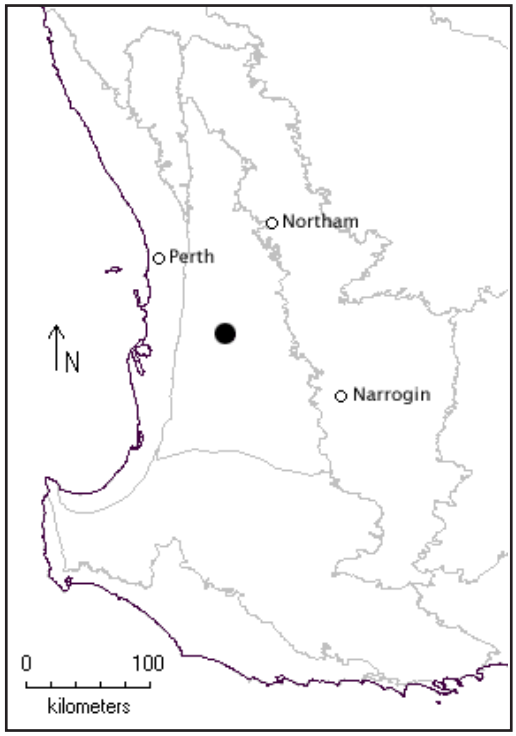

Figure 2. Distribution of *Darwinia hortiorum* (●) in south-west Western Australia. IBRA Bioregion boundaries (Department of the Environment, Water, Heritage and the Arts 2008) are shown in grey

Conservation status. *Darwinia hortiorum* was listed as Priority One under the informal phrase name *Darwinia* sp. Wandering (F. Hort 3273) by Smith (2010); this remains appropriate given its very localized distribution. It is locally common where it occurs, with population estimates to >500 plants. Some populations are in a gazetted Conservation Park; however, the area in which it occurs is threatened by *Phytophthora cinnamomi* dieback. Plants are killed by fire; many non-flowering juvenile plants have been observed in an area burnt 3-4 years previously (F. Hort, pers. comm.), suggesting that frequent fires may be deleterious for the species.

Etymology. Named in honour of Fred and Jean Hort, enthusiastic field botanists, expert plant-hunters and national treasures.

Affinities and notes. *Darwinia hortiorum* is distinctive with no obvious close relatives. It is superficially similar to *D. thymoides*, which occurs with it at some sites. Both species are small shrubs with small, ± erect inflorescences lacking distinctly differentiated inflorescence bracts. However, *D. thymoides* has opposite, ± flat leaves, fewer (2–10) flowers per inflorescence, small, free bracteoles <1/4 the length of the hypanthium, styles which are incurved at the apex and distinctive, warty oil glands at the apices of the petals. Vegetatively, *D. hortiorum* is similar to *D. apiculata*, but the inflorescences in that species are subtended by differentiated, coloured bracts.

Many species of *Darwinia* have slightly curved flowers, usually with the styles uncinate at their tips. In *D. hortiorum*, the corolla is more strongly zygomorphic than in other species, with the robust style emerging excentrically from the erect, fleshy petals and sigmoidally curved in such a way that all styles are presented in the centre of the inflorescence and are erect and not uncinate. This morphology is not seen in any other known species. The large, connate, bracteoles also appear to be unique.

In all populations there is a mix of red-flowered (with the petals distally suffused with crimson) and yellow-flowered (with the petals not suffused and hence pale yellow) individuals. There is no apparent colour change in the flowers after anthesis. The flowers have a pollen-presentation system, with a mix of pollen grains and oil deposited on the substigmatic brush of hairs as the style elongates during anthesis.

Acknowledgments

I would like to acknowledge Fred and Jean Hort for their diligence and expertise in surveying the flora of the Darling Range for new and noteworthy species. They brought this species to my attention, showed it to me in the field and collected excellent specimens from all known populations. Ryonen Butcher assisted during field work, Paul Wilson kindly translated the Latin diagnosis, and Mike Hislop and an anonymous reviewer provided invaluable comments on the manuscript.

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