

Two new species of *Dampiera* (Goodeniaceae) from the Pilbara region, Western Australia

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Abstract

B.J. Lepschi, M.E. Trudgen and S.J. van Leeuwen. Two new species of *Dampiera* (Goodeniaceae) from the Pilbara region, Western Australia. *Nuytsia* 15(2): 269–276 (2004). *Dampiera anonyma* and *Dampiera metallorum* Lepschi & Trudgen, two geographically restricted taxa from the Pilbara region of Western Australia, are described, illustrated and their distributions mapped.

Introduction

Dampiera R.Br. is an endemic Australian genus of the Goodeniaceae well represented in Western Australia, with 58 of the 66 described species so far recorded from the State (Paczkowska & Chapman 2000), the majority of which are endemic to the South-west Botanical Province. Four species, *D. atriplicina* C. Gardner ex Rajput & Carolin, *D. candicans* F. Muell., *D. cinerea* Ewart & O.B. Davies and *D. dentata* Rajput are recorded as occurring in the Pilbara region of the Eremaean Botanical Province (Paczkowska & Chapman 2000). None of the four recorded species are endemic to the Pilbara region, and extend further south, east, and (in the case of *D. candicans*), north into the Eremaean and Northern Botanical Provinces of the State.

The presence of two additional *Dampiera* species in the Pilbara region was recognised by one of the authors (MET) in the mid 1970s, but lack of suitable collections precluded formal recognition of these entities, known informally as *Dampiera* sp. Mt Bruce (M.E. Trudgen 1334) and *Dampiera* sp. Mt Meharry (M.E. Trudgen 1178). Since the 1970s, further collections of both taxa have been made, and a better understanding of their ecological preferences and distribution has also been gained, especially through recent fieldwork by SVL. Our research suggests that both entities represent distinct species, both of which are endemic to the Pilbara region, and both occupying geographically and ecologically restricted ranges.

In this paper we present descriptions of these two new species of *Dampiera*, along with notes on their distribution, ecological preferences and relationships. Amendments to the most recent key to *Dampiera* species in Australia (Rajput & Carolin 1992) are also presented, to aid the identification of these two new species.

Materials and methods

This study is based on examination of herbarium collections from KARR. (the Department of Conservation's regional herbarium situated in Karratha, Western Australia) and PERTH. All measurements were made from herbarium material (reconstituted where necessary). See the end of this issue for definitions of conservation codes used in this paper. Terminology for corolla hair types follow Rajput & Carolin (1992).

New species descriptions

Both species described here appear to belong to Sect. *Dampiera* Subsect. *Dampiera*, following the classification of Rajput & Carolin (1992), on the basis of stem and inflorescence morphology and growth habit. Phyllotaxy of the new species has not been investigated, but it could be expected to be 2/5, as has been reported for other taxa in Subsect. *Dampiera* (Rajput & Carolin 1992).

1. *Dampiera anonyma* Lepschi & Trudgen, *sp. nov.*

Ad *D. incanam* R.Br. similis sed illa specie fructo et ovulo stricto nunquam curvato differt.

Typus: Summit of Mt Nameless, Western Australia, 14 September 1991, Peter G. Wilson & R. Rowe 1088 (*holo*: PERTH 04003934; *iso*: BRI, DNA, NSW all *n.v.*)

Illustration. Rajput & Carolin, Fl. Australia 35: 52 (1992) [as *D. incana* var. *fuscescens*]

Multistemmed *perennial* 0.3–0.5 (–1) m, diffuse to straggling, less often compact and rounded. *Stems* angular-terete, becoming more or less terete with age, longitudinally ridged, with dense, spreading, whitish dendritic hairs, *c.* 0.1–1.1 mm long (hairs in leaf axils are longer, to 1.8 mm). *Leaves* alternate, obscurely petiolate to sessile; petiole 0–2 mm long; lamina obovate to narrowly obovate, narrowly to broadly elliptic or obovate-elliptic (sometimes narrowly so), rarely sub-falcate, becoming progressively reduced towards and within the inflorescence, 4–27.5 mm long, 1–16.5 mm wide; base attenuate to narrowly cuneate or parallel; apex acute to apiculate or rounded; margin entire or occasionally with 1 (–3) blunt teeth in the distal portion; hairy with dense, spreading, whitish dendritic hairs, *c.* 0.1–1.5 mm long, uppermost leaves (especially in the inflorescence) frequently glabrescent adaxially; senescent leaves may also be patchily glabrescent. *Inflorescence* a cymo-panicle, inflorescence branches solitary in leaf axils, 1–4 –flowered; branches and pedicels hairy with dense, spreading, whitish dendritic hairs, *c.* 0.2–1 mm long. *Pedicels* 0.5–5.2 mm long, ebracteolate. *Sepals* obscured by indumentum, broadly-ovate to rounded triangular, 0.2–0.3 mm long. *Corolla* blue to light-blue, bluish-purple or purple with yellow throat, 7–8 mm long, hairy abaxially with dense, spreading, whitish to grey type i dendritic hairs, *c.* 0.3–1.5 mm long; abaxial lobes narrowly obovate to very-narrowly elliptic or (for lateral lobes) sub-falcate, 3–3.5 mm long, 0.5–1.1 mm wide; connate part of abaxial lobes 3–5 mm long; wing 0.8–2.1 mm wide; adaxial lobes more or less falcate to narrowly elliptic, with a marginal bulge on the upper side (adjacent the auricle), 5.4–6 mm long, 1.2–1.9 mm wide; auricle maroon to purplish (when dry), 1.6–2.1 mm long, 1–1.1 mm wide; wing 0.7–1.4 mm wide (narrowest above auricle); calli absent. *Ovary* more or less cylindrical, straight, hairy with dense, spreading, whitish to grey type i dendritic hairs, *c.* 0.4–1 mm long, unilocular, 1.6–2.5 mm long; ovule 1, basifixed, straight, very-narrowly oblong to very-narrowly oblong-elliptic, 1–1.4 mm long; style (including indusium) 3.1–4.3 mm long, maroon to purplish (when dry), glabrous; indusium 0.8–1.1 mm wide. *Fruit* more or less

cylindrical, straight, longitudinally ridged to coarsely 'wrinkled' (these features obscured by the indumentum), 2.5–3.5 mm long, hairy (indumentum as on ovary), eventually glabrescent. (Figure 1 A, B).

Selected specimens examined. WESTERN AUSTRALIA: Top of Mt Nameless, 31 July 1980, K.J. Atkins & P. Wurm HI 779 (KARR., PERTH); summit of Mt Bruce, 19 Aug. 1963, J.S. Beard 2916 (PERTH); summit of Mt Sheila, 10 km NW of Hamersley Station Homestead, 7.5 km NNE of Mt McRae, Hamersley Range, 7 Aug. 1991, M. Hughes s.n. (KARR., PERTH); flat area near top of Mt Bruce (north side), Hamersley Range National Park, 23 June 1975, M.E. Trudgen 1334 (MEL, NSW, PERTH); Karijini National Park, Hamersley Range, Mt Hyogo, 8.2 km S of Marandoo Hill, 24 Aug. 1995, S. van Leeuwen 2057 (KARR., PERTH); Mt Bennett, 33.3 km WSW of Mt Barricade, Karijini National Park, Hamersley Range, 23 Aug. 1995, S. van Leeuwen 2070 (CANB, KARR., PERTH); Hamersley Range, 4.6 km SW of summit of Mt Truchanas, 10 Sep. 1996, S. van Leeuwen 2692 (KARR., PERTH); Mt Hyogo, 13.8 km SSE of Mt Bruce, Karijini National Park, Hamersley Range, 30 July 1998, S. van Leeuwen 3517 (AD, BRI, CANB, KARR., MEL, NSW, PERTH); 7.3 km NW of Mt Frederick, Hamersley Range, 6 Aug. 1998, S. van Leeuwen 3657 (CANB, K, KARR., PERTH); Mt Stevenson, 10.7 km S of Mt Frederick, Karijini National Park, Hamersley Range, 7 Aug. 1998, S. van Leeuwen 3696 (BRI, CANB, KARR., PERTH); Mt Bennett, 27.5 km ESE of Mt Truchanas, Karijini National Park, Hamersley Range, 7 Aug. 1998, S. van Leeuwen 3741 (CANB, KARR., PERTH, US); Mt Sheila, 7.6 km NNE of Mt McRae, Hamersley Range, 17 Aug. 1998, S. van Leeuwen 3781 (CANB, KARR., PERTH); summit ridge of Mt Bruce (at E end), Hamersley Range National Park, 17 Aug. 1974, J.H. Willis s.n. (MEL n.v., PERTH)

Distribution. Restricted to the western central Hamersley Range in the southern Pilbara region of Western Australia. (Figure 2).

Habitat. Grows on hill summits or upper slopes (above 1000 m), in skeletal, red-brown to brown gravelly soil, usually over massive banded ironstone of the Brockman Iron Formation, but also recorded from meta-basalt (Mt Bennett), shale and jaspilite (Mt Hyogo and Mt Hyogo West). On banded ironstone sites, vegetation is typically comprised of *Eucalyptus kingsmillii* and *E. gamophylla* shrub mallee (with emergent scattered *E. leucophloia*) over a diverse shrub and hummock grass (*Triodia* spp.) layer. On other substrates the eucalypts are replaced by *Brachychiton acuminatus* and *B. gregorii*.

Phenology. Flowers and fruits recorded during June to September.

Conservation status. Conservation Codes for the Western Australian Flora: Priority 3. It is recommended that the conservation status of this taxon be downgraded to Priority 4, as existing populations are not currently endangered and recent botanical survey work (by SVL) indicates that the taxon is more widespread than previously thought. Seven of the eleven known populations are afforded protection within Karijini National Park.

Etymology. From the Greek, *an* (without) and *onyma* (a name), in reference to the type locality (Mt Nameless). The epithet also highlights the fact that this species languished without a name for over 25 years, despite its recognition as a distinct taxon (by MET) in 1975.

Affinities. *Dampiera anonyma* is probably most closely related to *D. incana* R.Br., which it resembles in gross morphology, and collectors have generally referred material of *D. anonyma* to this species. Carolin & Rajput (1992) also included material of *D. anonyma* (Trudgen 1334 and Willis s.n., 17 Aug. 1974) in their concepts of *D. incana* var. *fuscescens* Benth. and var. *incana* respectively. However,

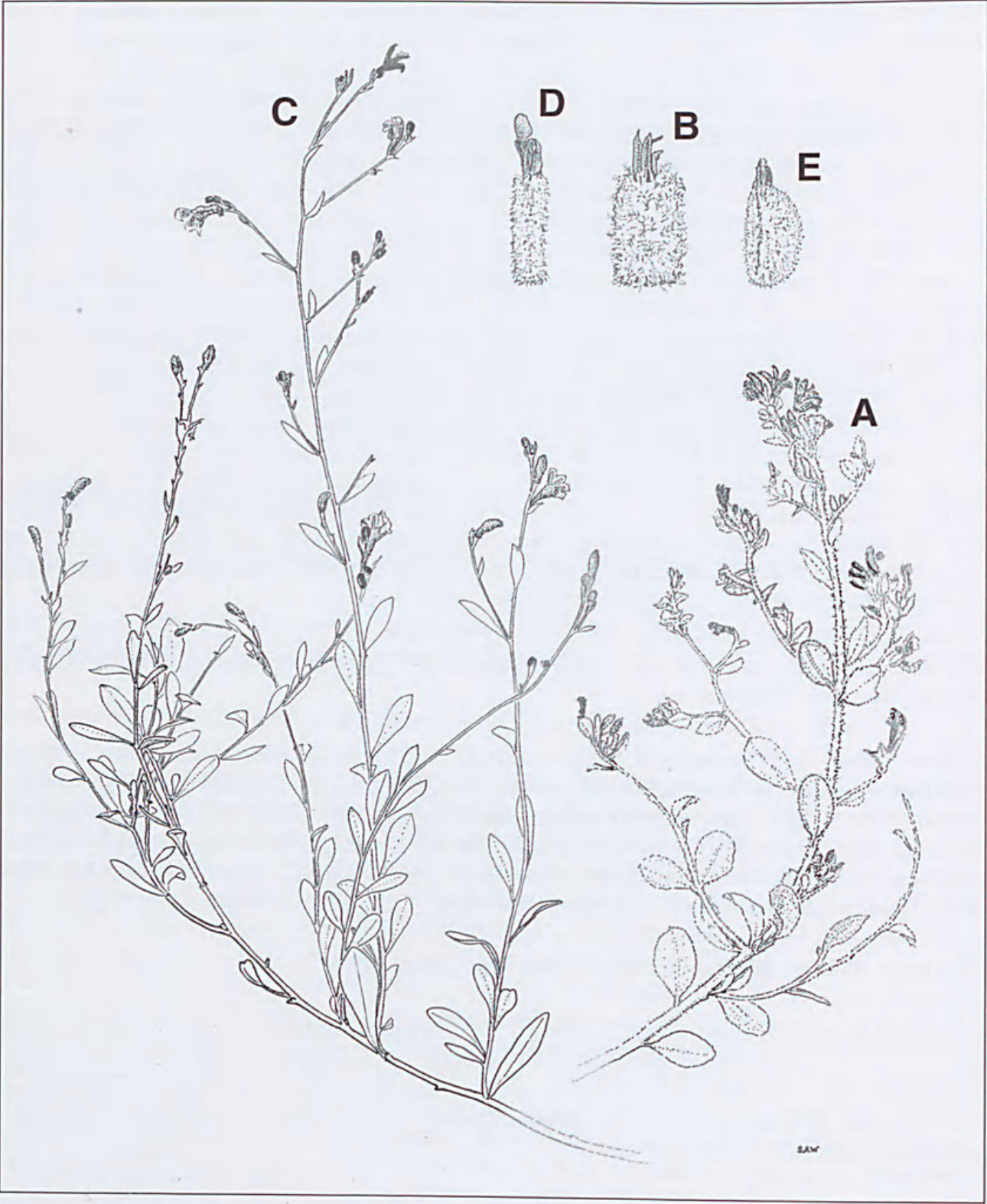


Figure 1. A-B. *Dampiera anonyma*. A – flowering branchlet, B – fruit (with floral remnants); C-D. *Dampiera metallorum*. C – flowering branchlet, D – fruit (with floral remnants); E. *Dampiera incana* fruit (with floral remnants). Drawn from S.J. van Leeuwen 3791 (A), S.J. van Leeuwen 3657 (B), J.N. Dunlop s.n. (PERTH 1714813) (C), S.J. van Leeuwen 4166 (D) and A.S. George 2580 (E).

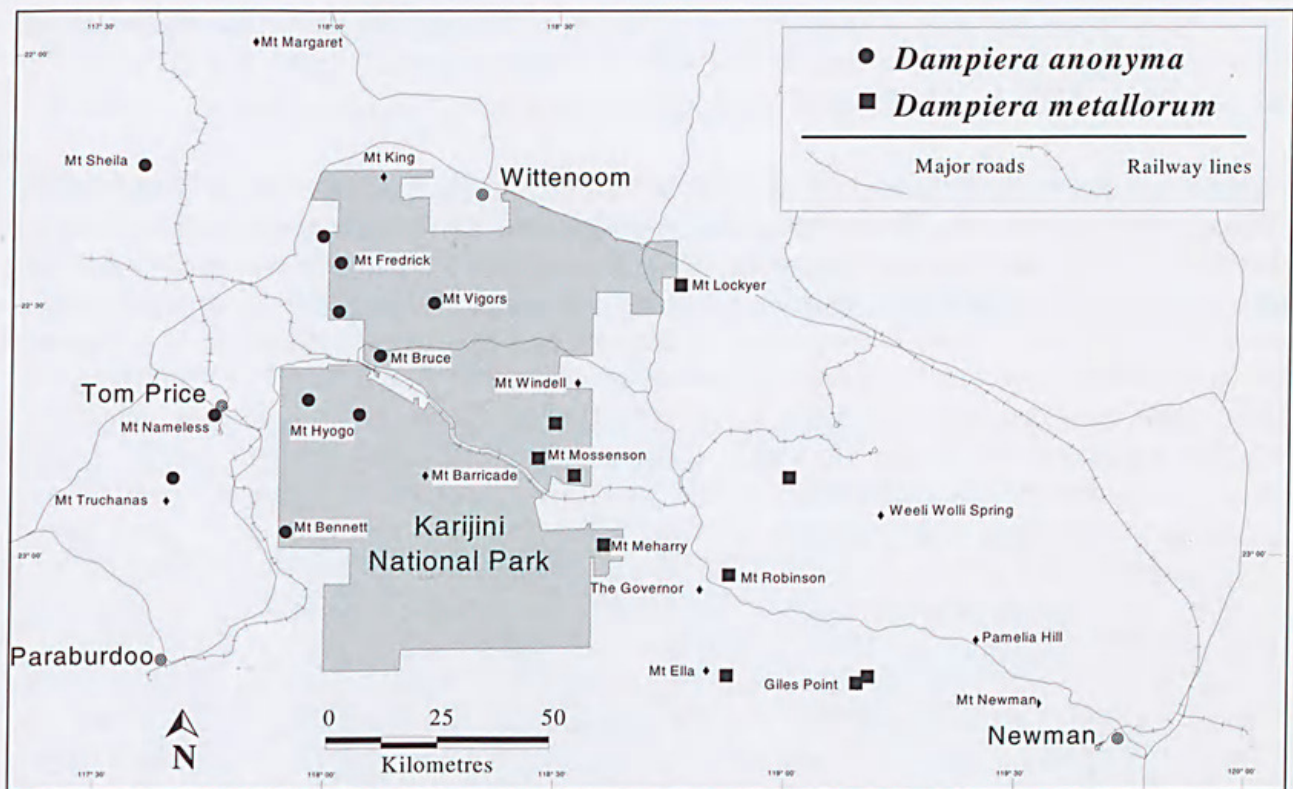


Figure 2. Distribution of *Dampiera anonyma* (●) and *D. metallorum* (■).

D. incana differs from *D. anonyma* in its curved (oblique), rather than straight, fruit and ovule (see Figure 1E), the more closely appressed and less 'loose' indumentum on the vegetative parts, and also leaf shape. In *D. incana* leaves tend to be narrowly-obovate to obovate, as opposed to the frequently broadly-elliptic to obovate or obovate-elliptic leaves of *D. anonyma*. The two species also have different ecological preferences, with *D. incana* occurring on sandy, frequently calcareous soils at low altitudes in coastal or near-coastal districts, and *D. anonyma* restricted to skeletal soils on banded ironstone formations above 1000m in the Pilbara region.

Dampiera anonyma also superficially resembles *D. tomentosa*, and early collections of *D. anonyma* have been referred to that taxon. However, *D. tomentosa* may readily be separated from *D. anonyma* by the long, silky indumentum on the corolla, comprising both type i and type ii hairs (to 3 mm long), and the frequently larger flowers (to 15 mm long).

Notes. This species has been referred to by the phrase name *Dampiera* sp. Mt Bruce (M.E. Trudgen 1334) in *herb.* at PERTH. Little is known of the biology of this species, although European honeybees (*Apis mellifera* L.) have been observed working inflorescences of *D. anonyma* (SVL pers. obs.).

2. *Dampiera metallorum* Lepschi & Trudgen, *sp. nov.*

Ad *D. incanam* R.Br. similis, sed illa specie fructo et ovulo stricto nunquam curvato, corolla plerumque indumento atratiore, et partibus vegetativis glabrescentibus magis celeriter, differt. Etiam ad *Dampiera roycei* Rajput foliis concoloris, et vegetativis partibus glabrescentibus magis celeriter, differt.

Typus: Mt Meharry, 350 m W of summit, 33.4 km WSW of Packsaddle Hill, Karijini National Park, Hamersley Range, Western Australia, 18 Sep. 1998, *S. van Leeuwen* 4033 (*holo*: PERTH 06232256; *iso*: AD, BRI, CANB, K, KARR., MEL, NSW, US).

Rounded, multistemmed *perennial* 0.3–0.5 m; vegetative parts with appressed whitish dendritic hairs, *c.* 0.05–0.15 mm long, dense when young, becoming glabrescent with age (hairs in leaf axils are longer (to 0.7 mm) and frequently spreading). *Stems* angular-terete, becoming more or less terete with age, longitudinally ridged. *Leaves* alternate, obscurely petiolate to sessile; petiole 0–3 mm long; lamina narrowly obovate to obovate or very-narrowly obovate to very-narrowly elliptic or very-narrowly triangular, becoming progressively reduced towards and within the inflorescence, 1.5–55 mm long, 0.3–11 mm wide; base attenuate to narrowly cuneate or parallel; apex acute to narrowly acute, apiculate or rounded; margin entire or occasionally with 1 (–2) blunt teeth in the distal portion. *Inflorescence* a cymopanicule, inflorescence branches solitary in leaf axils, 1–3 –flowered; branches and pedicels with appressed to spreading, whitish to grey dendritic hairs, *c.* 0.1–0.4 mm long, dense when young, becoming glabrescent with age. *Pedicels* 1.5–7.5 mm long, ebracteolate. *Sepals* obscured by indumentum, broadly ovate to rounded-triangular, 0.1–0.2 mm long. *Corolla* blue with yellow throat, 7–10 mm long, hairy abaxially with dense, spreading, grey to dark grey type i dendritic hairs, *c.* 0.1–0.8 mm long; abaxial lobes narrowly elliptic to sub-falcate (for lateral lobes), 3.5–4.8 mm long, 0.9–1 mm wide; connate part of abaxial lobes 3 mm long; wing 0.8–1.4 mm wide; adaxial lobes more or less falcate, with a marginal bulge on the upper side (adjacent the auricle), 4.5–4.8 mm long, 1.5–1.8 mm wide; auricle maroon to purplish (when dry), 1.5–1.6 mm long, 1–1.2 mm wide; wing 0.5–1.3 mm wide (narrowest above auricle); calli absent. *Ovary* more or less cylindrical to obovoid, straight, hairy with dense, spreading, grey to dark grey type i dendritic hairs, *c.* 0.1–0.8 mm long, unilocular, 2 mm long; ovule 1, basifixed, straight, very-narrowly oblong to very-narrowly oblong-elliptic, 0.9–1.2 mm long; style (including indusium) 3.3–3.8 mm long, maroon to purplish (when dry), glabrous; indusium 0.6–0.8 mm wide. *Fruit* more or less cylindrical, straight, longitudinally ridged, 2.5–3 mm long, hairy (indumentum as on ovary), becoming glabrescent with age. (Figure 1C-D).

Selected specimens examined. WESTERN AUSTRALIA: West Angelas, June 1984, *J.N. Dunlop* JT312 (PERTH); An unnamed gorge in the Hamersley Range, 29 Sept. 1974, *M.E. Trudgen* 1178 (MEL, NSW, PERTH); Karijini National Park, Hamersley Range, 9.3 km W of Wildflower Mountain, 23 Aug. 1995, *S. van Leeuwen* 2005 (CANB, KARR., PERTH); Mt Robinson, Hamersley Range, 6.3 km NE of The Governor, 19 April 1997, *S. van Leeuwen* 3141 (KARR., PERTH); Mt Mossenson, 23.3 km NNW of Mt Meharry, Karijini National Park, Hamersley Range, 29 July 1998, *S. van Leeuwen* 3490 (CANB, KARR., PERTH); 25.6 km NNE of Mt Robinson, Hamersley Range, 28 Sept. 1998, *S. van Leeuwen* 4059 (AD, BRI, CANB, K, KARR., PERTH); Mt Robinson, 6.5 km NE of the Governor, Hamersley Range, 29 Sept. 1998, *S. van Leeuwen* 4108 (CANB, KARR., PERTH); 4.7 km E of Mt Ella, Hamersley Range, 30 Sept. 1998, *S. van Leeuwen* 4166 (CANB, KARR., PERTH); Giles Point, 28 km WSW of Pamela Hill, Ophthalmia Range, 2 Oct. 1998, *S. van Leeuwen* 4261 (CANB, KARR., PERTH); 2.9 km NE of Giles Point, Ophthalmia Range, 2 Oct. 1998, *S. van Leeuwen* 4269 (CANB, KARR., PERTH)

Distribution. Restricted to the eastern central Hamersley Range and the adjacent Ophthalmia Range in the southern Pilbara region of Western Australia. (Figure 2).

Habitat. Grows on hill summits or upper slopes (above 1000 m), in skeletal, red-brown gravelly soil over massive banded ironstone of the Brockman Iron Formation. Vegetation typically comprises *Eucalyptus kingsmillii*, *E. ewartiana* and *E. gamophylla* shrub mallee over a diverse shrub and

hummock grass (*Triodia* spp.) layer.

Phenology. Flowers and fruits recorded during April and June to October.

Conservation status. Conservation Codes for the Western Australian Flora: Priority 3. As with *D. anonyma*, it is recommended that the conservation status of this taxon be downgraded to Priority 4, as existing populations are not currently endangered and recent botanical survey work (by SVL) indicates that the taxon is more widespread than previously thought. Four of the ten known populations are protected within Karijini National Park.

Etymology. From the Latin, *metallum* (mine, ore, mineral), in reference to the occurrence of this species on highly mineralised, ore-rich substrates in an active mining province.

Affinities. *Dampiera metallorum* appears to be allied to *D. incana* and *D. roycei*, with which it shares similar vegetative and floral morphology. *Dampiera incana* may be distinguished from *D. metallorum* by the denser, more persistent indumentum on the vegetative parts, generally paler corolla hairs, and the curved (oblique) fruit and ovule (see Figure 1E). *Dampiera roycei* differs from *D. metallorum* in the more persistent indumentum on the vegetative parts, entire, frequently discoloured leaves (the abaxial surface is glabrescent) and the presence of both type i and type ii hairs on the corolla. *Dampiera incana* and *D. roycei* also exhibit different ecological preferences to *D. metallorum*. *Dampiera incana* grows on sandy, frequently calcareous soils at low altitudes in coastal or near-coastal districts, while *D. roycei* grows in sandy (or less often loamy or clayey) soils at similarly low altitudes in arid areas. *Dampiera incana*, *D. roycei* and *D. metallorum* also all occupy geographically distinct ranges.

Notes. First recognised as a distinct taxon by MET in 1975, this species has been referred to by the phrase name *Dampiera* sp. Mt Meharry (M.E. Trudgen 1178) *in herb.* at PERTH. As with *D. anonyma*, little is known about the biology of *D. metallorum*. However, observations by SVL indicate that *D. metallorum* is a vigorous basal resprouter, regenerating from basal adventitious buds after burning. Plants have been recorded flowering less than 12 months after fire.

Amendments to "Flora of Australia" key

In the treatment of *Dampiera* in the *Flora of Australia* (Rajput & Carolin 1992), *D. metallorum* will key to either Group 6 or Group 8 in the 'Key to artificial groups', depending on the material available, and *D. anonyma* keys to Group 8 in the 'Key to artificial groups'.

For the taxa in Group 6, the key to species requires alteration to accommodate *D. metallorum*. Couplets 7 to 9 should then be replaced with the following:

- 7. Corolla 7–10 mm long
 - 8. Leaf margins revolute. Arid southern W.A. ***D. eriantha***
 - 8: Leaf margins flat, not revolute. Pilbara region of W.A. or eastern Qld & N.S.W.
 - 9. Corolla with type ii hairs. Eastern Qld and N.S.W. ***D. adpressa***
 - 9: Corolla with type i hairs. Pilbara region, W.A. ***D. metallorum***
- 7: Corolla 13–20 mm long
 - 10. Corolla hairs slate grey, closely tomentose ***D. juncea***
 - 10: Corolla hairs silvery grey, loosely tomentose ***D. oligophylla***

The following revised key to Rajput & Carolin's (1992) Group 8 will allow recognition of both *D. anonyma* and *D. metallorum*.

1. Corolla yellow **D. luteiflora**
- 1: Corolla blue or purple
 2. Corolla hairs appressed **D. orchardii**
 - 2: Corolla hairs not appressed
 3. Lower leaf surface clearly visible beneath hairs
 4. Corolla with type i and/or type ii hairs. Low altitudes in W.A. and N.T.
 5. Corolla with type i and ii hairs; arid W.A. and adjacent N.T. **D. roycei**
 - 5: Corolla with type ii hairs only; south-western W.A. **D. haematotricha**
 - 4: Corolla with type i hairs only. High altitudes (>1000 m) in the Pilbara region, W.A. **D. metallorum**
 - 3: Lower leaf surface completely hidden beneath dense hairs
 6. Corolla hairs long, silky, branched mostly near base **D. tomentosa**
 - 6: Corolla hairs short, not silky, branched along their length
 7. Upper leaf surface glabrescent, leaves frequently discoloured; corolla with type i and type ii hairs **D. roycei**
 - 7: Upper leaf surface with persistent indumentum, leaves concoloured; corolla with type i hairs only
 8. Fruit and ovule curved. Coast and adjacent areas at low altitudes, W.A. **D. incana**
 - 8: Fruit and ovule straight. High altitudes (>1000 m) in the Pilbara region, W.A. **D. anonyma**

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