

New taxa of *Caladenia* (Orchidaceae) from south-west Western Australia – six new species and four new subspecies

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Abstract

Brockman, G. & Brown, A.P. New taxa of *Caladenia* (Orchidaceae) from south-west Western Australia – six new species and four new subspecies. *Nuytsia* 37: 94–117 (2026). Six species – *Caladenia allochroa* G.Brockman & A.P.Br., *C. haemantha* G.Brockman & A.P.Br., *C. lawsonii* G.Brockman & A.P.Br., *C. primotina* G.Brockman & A.P.Br., *C. salina* G.Brockman & A.P.Br. and *C. silvicola* G.Brockman & A.P.Br., and four subspecies, *C. caesarea* (Domin) M.A.Clem. & Hopper subsp. *adontia* G.Brockman & A.P.Br., *C. flava* R.Br. subsp. *albescens* G.Brockman & A.P.Br., *C. flava* R.Br. subsp. *secunda* G.Brockman & A.P.Br. and *C. longicauda* Lindl. subsp. *nematilis* G.Brockman & A.P.Br., are formally described, their relationships with related taxa discussed and the conservation status of rare taxa assessed.

Introduction

Named by Robert Brown (Brown 1810), the large, predominantly Australian genus *Caladenia* comprises 371 currently recognised species (A.P. Brown unpublished data). Most are endemic to southern Australia with *C. catenata* (Sm.) Druce and *C. carnea* R.Br. also found in New Caledonia (Jaffré *et al.* 2001), the latter extending through Indonesia including Sulawesi and West Papua (Comber 1990). Eleven species are found in New Zealand, ten of which are endemic and one, *C. alata* R.Br., is also found in Australia (Jones 2006). Western Australia has 138 recognised species, 129 of which are formally named (Western Australian Herbarium 1998–). In addition, 20 formally named hybrids are found in Western Australia (Hopper & Brown 2001, Brown *et al.* 2013, Brown 2022).

Here we formally name an additional six species and four subspecies of *Caladenia*. All but one, *C. flava* R.Br. subsp. *albescens*, were illustrated in Brown (2022) where they were provided informal phrase names. Several other currently undescribed *Caladenia* taxa are also thought to warrant being formally named but require further field and herbarium study.

Methods

Field surveys throughout south-west Western Australia and examinations of dried specimens lodged at PERTH have been undertaken over several decades, and specimen cards have been made for species comparison by placing dissected flower parts under 3M acid free tape, enabling morphological comparisons between the new taxa and related, currently named taxa.

In all cases, annual examination of flowering plants in the field comparing morphological characters and size ranges has been conducted to ensure characters distinguishing these taxa are consistent over their respective distributional ranges. Field studies have provided information on biology, ecology and phenology for each of the new taxa examined, enabling us to compare the habitat differences (including

vegetation, soil and water relations) and the flowering times between the new taxa and related taxa. herbarium specimens were collected in many but not all the known locations for distribution records. The taxa described here exhibit consistent and measurable differences in morphology, ecology, distribution and, in some cases, flowering times from closely related taxa, compatible with recognition at species and subspecies level.

Taxonomy

Caladenia allochroa G.Brockman & A.P.Br., *sp. nov.*

Type: Dragon Rocks Nature Reserve track to granite, west of Newdegate North Road, Western Australia, 4 September 2008, G. Brockman GBB 2322 (*holo:* PERTH 08050228).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 85 (2022), as *Caladenia* sp. ‘central wheatbelt’.

Plants solitary or in small to large clumps. *Leaf* 80–170 mm long, 3–8 mm wide, linear, erect, incurved in transverse section (TS), pale green, the basal 1/5–1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 150–250 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract 1/2–2/3 way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–2(–3), 80–140 mm across, cream, creamy yellow, yellow or red, often with pale maroon stripes and markings; floral odour faint, earthy. *Sepals* and *petals* linear-lanceolate in the basal 1/5–1/3 then narrowing before terminating in a blood-red, pinkish red or dark brown, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 70–85 mm long, 2–2.5 mm wide, erect to slightly incurved. *Lateral sepals* 75–95 mm long, 2.5–3 mm wide, spreading horizontally near the base and pendulous to sub-pendulous towards the apex. *Petals* shorter than the sepals, 60–80 mm long, 2.5–3 mm wide, spreading horizontally near the base and either curving obliquely downwards or pendulous to sub-pendulous towards the apex. *Labellum* obscurely 3-lobed, white, pale yellow or red with pale to dark red stripes and markings, stiffly articulated on a claw 1–1.5 mm wide; lamina 10–13 mm long, 7.5–8.5 mm wide, linear rhomboidal to narrowly-triangular in outline when flattened, erect with entire margins in the basal 1/4–1/3, nearly horizontal in the middle 1/3–1/2 and prominently recurved in the apical 1/4–1/3; lateral lobes moderately curved upwards with truncate, forwardly uncinat, creamy white marginal calli > 1 mm long that are decrescent towards the apex; lamina calli creamy white with pale red markings in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum, anvil-shaped, the longest c. 1 mm tall, decrescent towards the apex. *Column* 9–10 mm long, 2.5–3 mm wide, broadly winged, creamy white with red markings and suffusions, outer surface sparsely hirsute with short glandular hairs, inner surface with sparse short glandular hairs in the basal half only. *Anther* 1.5 mm long, 1.5 mm wide, yellow to greenish yellow. *Pollinia* c. 1.5 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, c. 1.5 mm wide, greenish yellow. *Capsule* not seen. (Figure 1)

Diagnostic features. *Caladenia allochroa* may be distinguished from all other members of the genus by the following combination of characters: flowers cream, creamy yellow, yellow or red; lateral sepals pendulous to subpendulous; petals shorter than the sepals spreading horizontally near the base and either curving obliquely downwards or pendulous to sub-pendulous towards the apex; labellum lamina 10–13 mm long, 7.5–8.5 mm wide, white, pale yellow or red with pale to dark red stripes and markings; lateral lamina lobes moderately curved upwards with truncate, forwardly uncinat, creamy white marginal calli; lamina calli creamy white with pale red markings in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum; labellum apex prominently recurved.

Other specimens examined. WESTERN AUSTRALIA: Namelcatchem Nature Reserve, SW of Wyalkatchem, on Goomalling-Wyalkatchem Road, 12 Sep. 2004, G. Brockman GBB 1354 (PERTH);



Figure 1 *Caladenia allochroa*. A – flowers in a clump; B – labellum details. Unvouchered. Photographs: G. Brockman

3 km W of Wyalkatchem on Goomalling Road Rail Reserve on N side along railway line, 12 Sep. 2004, *G. Brockman* GBB 1359 (PERTH); McDonald Rock on southern boundary of Dragon Rocks Nature Reserve, E side of Newdegate North Road, access along fence line, 4 Sep. 2008, *G. Brockman* GBB 2324 (PERTH); Holland Tank, Holland Tank Road, 500 m W of Day Road, NE of Pingrup, 6 Sep. 2008, *G. Brockman* GBB 2327 (PERTH); Jubuck North Road, 100 m N of Brookton-Corrigin Road, W of Corrigin, 10 Sep. 2009, *G. Brockman* GBB 2469 (PERTH); Jubuck Reserve, track 200 m N of Brookton Highway running parallel from Szczecinski Road, 1 km to reserve, W end. 20 km W of Corrigin, 10 Sep. 2010, *G. Brockman* GBB 2472 (PERTH); Newdegate South Road, 5.7 km NE of Ivanhoe Farm, S of Newdegate, 12 Sep. 2009, *G. Brockman* GBB 2490 (PERTH); Dragon Rocks Nature Reserve, No. 36128, Lanes Rock, 19 Sep. 1991, *A.M. Coates* 2827 (PERTH); Near Dryandra, NNW of Narrogin, 29 Sep. 1971, *A.S. George* 11054 (PERTH); Nature Reserve, c. 200 m E of crossing of Cunderdin-Minnivale Rd, 15 km E of Dowerin, 31 Aug. 1984, *S.D. Hopper* 3996[b] (PERTH); 6 km NE of Toolibin, 800 m W of Wedin North Road on Wickepin-Harrismith Road, 7 Sep. 1984, *S.D. Hopper* 4118 b (PERTH); NW corner of Elphin Nature Reserve at Wongan Hills, 2 km N of the Wongan-Waddington Road, 2 Sep. 2015, *R. Phillips & A. Weinstein* RDP 0316 (PERTH).

Phenology. Flowering late August to September.

Distribution and habitat. Found between Wyalkatchem and Pingrup, growing in sandy and sandy-clay soils in woodlands, shrublands and shallow soil pockets on granite outcrops. Associated species include *Eucalyptus loxophleba*, *Acacia* and *Hakea* species.

Conservation status. *Caladenia allochroa* is not considered to be of conservation concern. The species is found over a wide geographic range and is adequately conserved in conservation reserves.

Etymology. From the Greek *allochroa* (changing from one colour to another), alluding to the variable flower colouration.

Common name. Central Wheatbelt Spider Orchid.

Affinities. *Caladenia allochroa* is most similar in morphology to *C. dimidia* Hopper & A.P.Br. and was at one time considered a form of that species. It is, however, distinguished from *C. dimidia* by its larger flowers with longer, pendulous to sub-pendulous lateral sepals 75–95 mm long (*cf.* 50–75 mm long and spreading obliquely downwards), longer, downcurved, pendulous to sub-pendulous petals 60–85 mm long (*cf.* 45–65 mm long and spreading obliquely upwards to horizontal) and larger labellum 10–13 mm long and 7.5–8.5 mm wide (*cf.* 7–11 mm long, 6–8 mm wide). Although the distributions of these two species overlap, *C. allochroa* has a predominantly more westerly and southerly distribution than *C. dimidia*.

Caladenia allochroa has affinities with *C. polychroma* Hopper & A.P.Br. but is readily distinguished from that species by its narrower lateral sepals 2.5–3 mm wide (*cf.* 3–4 mm wide), narrower labellum 7.5–8.5 mm wide (*cf.* 10–13 mm wide), smaller column 9–10 mm long, 2.5–3 mm wide (*cf.* 10–13 mm, 4–6 mm wide) and more northerly distribution with no apparent overlap.

Caladenia caesarea (Domin) M.A.Clem. & Hopper subsp. ***adontia*** G.Brockman & A.P.Br., *subsp. nov.*

Type: Boddington, Western Australia, [precise locality withheld for conservation reasons], 28 September 2023, K. Smith, V. Smith & G. Brockman GBB 4601A (*holo:* PERTH 10000410; *iso:* CANB).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 107 (2022), as *Caladenia caesarea* subsp. ‘Mooradung’.

Plants solitary or in clumps. *Leaf* 70–150 mm long, 3–6 mm wide, linear, erect, incurved in TS, pale green, the basal 1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 160–300 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract half way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–2(–3), 60–80 mm across, often stiffly held, lemon-yellow with rich brown to maroon stripes and blotches; floral odour earthy (like damp soil). *Sepals* and *petals* linear-lanceolate in the basal 1/3–2/5 then abruptly narrowing before terminating in a brown to reddish brown, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 40–45 mm long, 2–2.5 mm wide, erect to slightly incurved. *Lateral sepals* 45–50 mm long, 2–3 mm wide, spreading obliquely downwards to horizontal, more rarely spreading obliquely upwards. *Petals* shorter than the sepals, 40–45 mm long, 2–2.5 mm wide, spreading obliquely upwards to horizontal, more rarely spreading obliquely downwards. *Labellum* obscurely 3-lobed, lemon-yellow with rich brown to maroon stripes and blotches, stiffly articulated on a claw 1–1.5 mm wide; lamina 10–15 mm long, 7–9 mm wide, narrowly triangular in outline when flattened, erect with entire margins in the basal 2/5, nearly horizontal in the middle 2/5 and sharply down-curved in the apical 1/5; distal margins shortly down-curved with either widely spaced, serrate, lemon-yellow marginal calli or with entire margins; lamina calli in 7–10 pairs in two rows extending up to half the length of the labellum, yellow, glistening on top, anvil-shaped, the longest *c.* 1 mm tall, decrescent towards the apex. *Column* 8–9 mm long, 2–3 mm wide, narrowly winged, greenish yellow with brown to reddish brown markings. *Anther* 1–1.5 mm long, 1–1.5 mm wide, yellow to greenish yellow. *Pollinia* 1–1.5 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, 1–1.5 mm wide, greenish yellow. (Figure 2A & B)

Diagnostic features. *Caladenia caesarea* subsp. *adontia* can be distinguished from all other subspecies of *C. caesarea* by the following combination of characters: flowers lemon-yellow with rich brown to maroon stripes and blotches; lateral sepals spreading obliquely downwards to horizontal, more rarely spreading obliquely upwards; petals shorter than the sepals, spreading obliquely upwards to horizontal, more rarely spreading obliquely downwards; labellum distal margins shortly downcurved and with either widely spaced, serrate marginal calli or entire; labellum lamina calli yellow, glistening on top, anvil-shaped, in 7–10 pairs in two rows extending up to half the length of the labellum; labellum apex sharply down-curved.

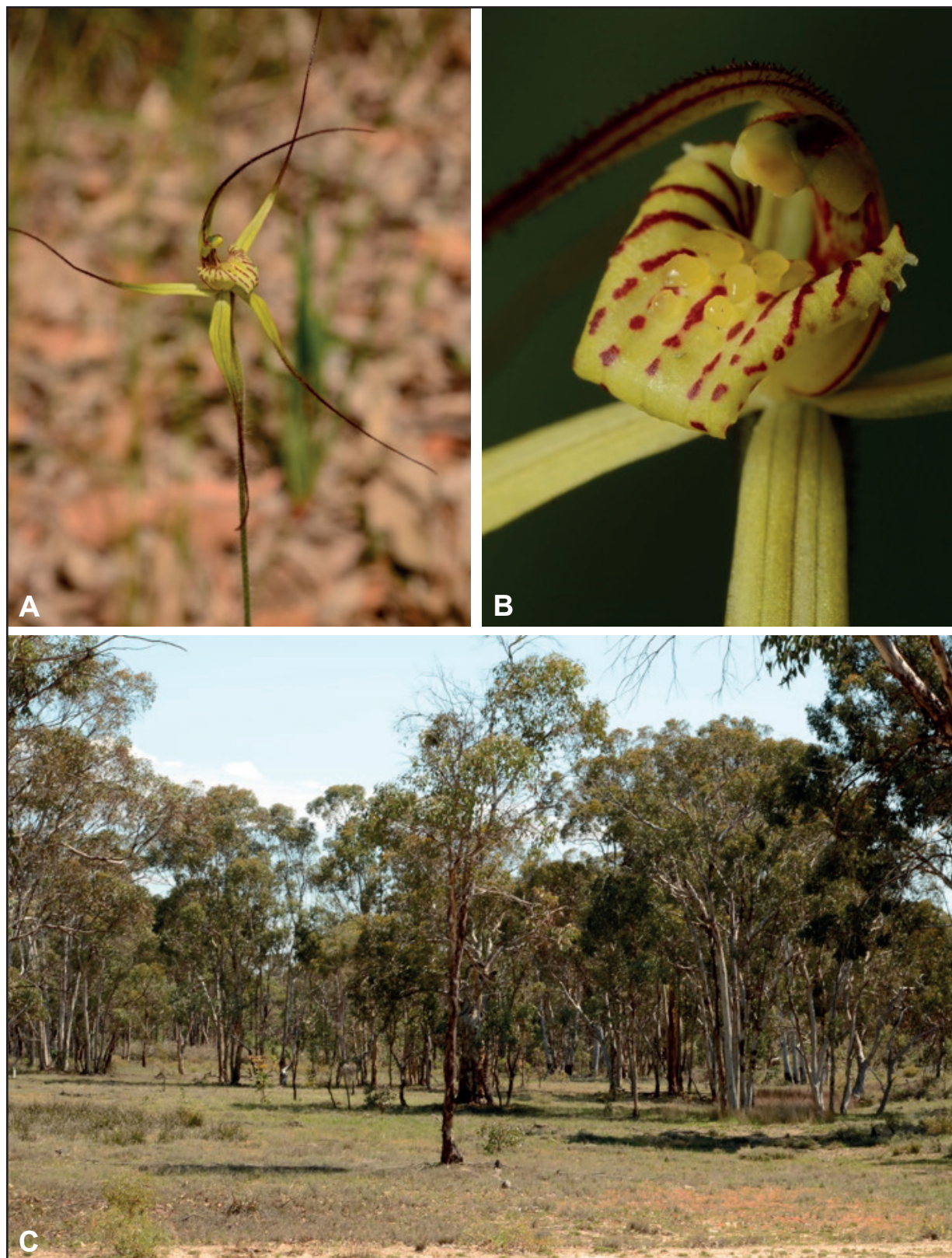


Figure 2. *Caladenia caesarea* subsp. *adontia*. A – flower; B – labellum details. C – habitat. Voucher: *G. Brockman* GBB 3357 (A, B). Photographs: *G. Brockman*.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 3 Oct. 2014, *G. Brockman* GBB 3357 (PERTH); 24 Sep. 2015, *G. Brockman* GBB 3401A (PERTH).

Phenology. Flowering mid-September to early October.

Distribution and habitat. Found over a narrow geographic range south-east and north-west of Boddington, growing in red brown loam on the margins of seasonal drainage lines and in grey sandy clay in a broad, seasonally damp flat. Habitat comprises open *Eucalyptus wandoo* and *E. rudis* woodland over *Gastrolobium calycinum*, *Hakea prostrata* and annuals (Figure 2C).

Conservation status. To be listed as Priority Two under Conservation Codes for Western Australian Flora (Tanya Llorens pers. comm.). *Caladenia caesarea* subsp. *adontia* is currently known from just three small populations, together comprising less than 26 mature plants. Two populations are in a mining lease and may be threatened by future mining operations. The third population, of just three plants, is in a Nature Reserve.

Etymology. From the Greek prefix *a-* (without) and *dontia* (teeth), alluding to the reduced number or absence of lateral labellum calli.

Common name. Mooradung Mustard Orchid.

Affinities. *Caladenia caesarea* subsp. *adontia* appears most similar in morphology to *Caladenia caesarea* subsp. *transiens* Hopper & A.P.Br. and, like that subspecies, has a prominently recurved apex to the labellum. It is, however, readily distinguished from subsp. *transiens* by its larger flowers 60–80 mm across (cf. 50–60 mm across), longer petals 40–45 mm long (cf. 35–40 mm long) and usually broader labellum 7–9 mm across (cf. 6–7.5 mm across) which sometimes has entire margins (always serrate margined in *C. caesarea* subsp. *transiens*).

Caladenia caesarea subsp. *adontia* may be distinguished from all other subspecies of *C. caesarea* by its labellum which has a sharply downcurved apex and occasionally has entire margins, in all other subspecies the labellum apex projects outward and is always serrate margined.

Notes. The new subspecies was brought to our attention in October 2012 by orchid enthusiast Keith Smith who located plants in several small populations near Boddington. The subspecies has been found in just one other area since that time.

***Caladenia flava* R.Br. subsp. *albescens* G.Brockman & A.P.Br., subsp. nov.**

Type: Robinson Road, Roleystone, 400 m south of Chevin Road, Western Australia, 28 September 2023, G. Brockman GBB 4586 (*holo:* PERTH 09796355).

Plants solitary or in loose colonies. *Leaf* 130–180 mm long, 11–16 mm wide, obliquely ascending, broadly linear, flattened in TS, the upper surface green with the basal 1/3 irregularly blotched red-purple, the lower surface green suffused with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 120–150 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract half way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–3, 35–45 mm across, pale lemon-yellow and white, often lacking red markings or, where present, usually inconspicuous. *Sepals* and *petals* stiffly held, broadly lanceolate, the apex shortly acute and lacking a swollen osmophore. *Dorsal sepal* 20–25 mm long, 8–11 mm wide, erect, pale lemon-yellow becoming white apically, and often with faint red spots and markings predominantly centred on a medial line. *Lateral sepals* 25–35 mm long, 9–13 mm wide, spreading horizontally to obliquely downwards, pale lemon-yellow becoming white apically, lacking any red spots and markings. *Petals* shorter than the sepals, 15–20 mm long, 7–10 mm wide, spreading obliquely upwards, pale lemon-yellow becoming white apically, often with faint red spots and markings centred on a medial line. *Labellum* prominently 3-lobed, creamy yellow basally, terminating in a paler creamy yellow to white horizontally projecting apex, stiffly articulate on a claw c. 1–1.5 mm wide; lamina hastate, 8–10 mm long, 8–10 mm wide when flattened with lateral lobes projecting obliquely when flattened, basal 1/5 of labellum curving from erect to horizontal, apical 4/5 horizontal except for lateral lobes, margins at widest point deeply curved upwards and terminated by

vertically ascending calli 1–1.5 mm long; lateral lobes falcate, acute, with entire proximal margins, distal margins entire or fimbriate with few linear narrowly capitate obliquely ascending forward-facing calli to 2 mm long; mid-lobe margins fimbriate proximally with 2–3 pair of linear narrowly capitate obliquely ascending to horizontal forward facing calli to 2 mm long, becoming entire towards the acute apex. *Lamina calli* in 5–6 pairs held aloft in a semicircular or horseshoe pattern on the perimeter of a callus plate which is spherical to oblong when viewed from above, extending about a third the length of the lamina, erect to forward-facing, linear, acute, equal in length, to 2 mm, golden to lemon-yellow, broadening and connate at base. *Column* 9–11 mm long, 4–5 mm wide, broadly winged, lacking auricular lobes, creamy yellow. *Anther* 1–1.5 mm long, 1–1.5 mm wide, golden yellow, apex caudate. *Pollinia* c. 1 mm long, aggregated in 4–6 broadly club-shaped united segments, yellow. *Stigma* horizontally elliptical, c. 2 mm wide, greenish yellow. Capsule not seen. (Figure 3)

Diagnostic features. *Caladenia flava* subsp. *albescens* can be distinguished from all other subspecies of *C. flava* by the following combination of characters: flowers pale lemon-yellow and white with inconspicuous red spots and markings. Sepals and petals stiffly held, broadly lanceolate, the apex shortly acute and lacking a swollen osmophore. Labellum creamy yellow basally, terminating in a creamy yellow to white horizontally projecting apex, lamina central calli in 4–6 pairs held aloft in a semicircular or horseshoe pattern on the perimeter of a callus plate. Lateral labellum calli in 2–3 pairs.

Other specimens examined. WESTERN AUSTRALIA: Gravel track from Canning Mills Road, 1 km W of Canning Road, NW into catchment for Victoria Reservoir, 20 Oct. 2008, *G. Brockman* GBB 2394 (PERTH); Canning Road, 1.2 km S of Pickering Brook Road, 1 Oct. 2024, *G. Brockman* GBB 4672 (PERTH); Canning Mills Road, 159 m E of Douglas Road, Martin, 30 Sep. 2025, *G. Brockman* GBB 4808 (PERTH); Canning Mills Road, Canning Mills, 30 Sep. 2025, *G. Brockman* GBB 4809 (PERTH); Chevin Road, phone tower and adjacent powerline, 6 Oct. 2025, *G. Brockman* GBB 4810 (PERTH); Welshpool Road, TV tower near E end, 6 Oct. 2025 *G. Brockman* GBB 4812 (PERTH); Albany Highway, Canning Dam Road, 21 Oct. 2025, *G. Brockman* GBB 4813 (PERTH); Cell 1, John Forrest National Park, S of railway, bearing SW, 6 Oct. 1998, *R. Davis* 6771 (PERTH); Canning Mills Site 2, 2 km along Canning Mills Road from Y junction with Mills Road, Kelmscott, 20 Sep. 1985, *R. Peakall* 0034 (PERTH); Norwood Reserve (Kalamunda Reserve 22502), off Norwood Road, Maida Vale, 3.8 km WNW of Kalamunda, 17 Oct. 2004, *G. Smith* 164 (PERTH).

Distribution and habitat. Found over a narrow geographic range in the Darling Range, from Kalamunda south to Albany Highway, NE of Jarrahdale, growing in mixed Jarrah/Marri woodland on red brown lateritic loam.

Phenology. Flowering late September to early November.

Conservation status. Common over a restricted range on the mid Darling Scarp, and protected within the Greenmount and Jarrahdale State Forests, Monadnocks Conservation Park and Lesmurdie Falls, Korung and Midegeooroo National Parks, and not considered of conservation concern.

Etymology. From the Latin *albescens* (becoming white), alluding to the pale yellow and white flowers.

Common name. Darling Scarp Cowslip Orchid.

Affinities. *Caladenia flava* subsp. *albescens* is distinguished from *C. flava* subsp. *flava* by its pale lemon-yellow flowers with white-tipped petals and sepals often lacking red markings (*cf.* bright yellow with prominent red markings) and its later flowering period in areas where the two taxa occur near one another. In these areas *C. flava* subsp. *flava* has finished flowering in late September when *C. flava* subsp. *albescens* begins flowering.

Caladenia flava subsp. *albescens* is distinguished from *C. flava* subsp. *maculata* Hopper & A.P.Br. in its pale lemon-yellow flowers with white-tipped petals and sepals often lacking red markings (*cf.* bright



Figure 3. *Caladenia flava* subsp. *albescens*. A – whole plants; B – labellum details; Voucher: *G. Brockman* GBB 4809 (A), GBB 4812 (B). Photographs: *G. Brockman*.

yellow flowers with prominent red markings) and later flowering period from late September to early November (*cf.* August to early September). The two subspecies are also well separated geographically and occur in different habitats with *C. flava* subsp. *albescens* growing in lateritic soils in mixed *Eucalyptus marginata*, *Corymbia calophylla* forest on the Darling Scarp (*cf.* red or yellow sandy loam in shrublands in the northern wheatbelt).

Caladenia flava subsp. *albescens* is distinguished from *C. flava* subsp. *sylvestris* Hopper & A.P.Br. in having shorter flower scapes 120–150 mm high (*cf.* 120–300 mm high) and larger flowers 35–45 mm across (*cf.* 20–25 mm across) which lack the prominent red markings on the petals and dorsal sepal displayed in *C. flava* subsp. *sylvestris*. The two subspecies are geographically separated.

Caladenia flava subsp. *albescens* is distinguished from *C. flava* subsp. *secunda* (formally described elsewhere in this paper), in having larger, less colourful pale lemon-yellow and white flowers 35–45 mm across (*cf.* flowers 25–35 mm across and bright yellow with prominent red markings). *Caladenia flava* subsp. *albescens* has a different habitat and range of distribution to *C. flava* subsp. *secunda*, being found in mixed *Eucalyptus marginata*, *Corymbia calophylla* forest on the Darling Scarp (*cf.* *Eucalyptus wandoo* woodland along the western edge of the wheatbelt).

***Caladenia flava* R.Br. subsp. *secunda* G.Brockman & A.P.Br., subsp. nov.**

Type: Ramsay Road, 2.8 km from Woods Loop, Luptons Nature Reserve, Western Australia, 12 October 2008, G. Brockman GBB 2379 (*holo:* PERTH 08065004).

Caladenia flava subsp. late red (G. Brockman GBB 2381), Western Australian Herbarium, in *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed 11 March 2025].

Illustrations. A. Brown, P. Dundas, K. Dixon & S. Hopper, *Orchids of Western Australia*, p. 115, Figure C (2008) [as *C. flava* subsp. ‘Brookton Highway’]; A. Brown, K. Dixon, C. French & G. Brockman, *Field guide to the orchids of Western Australia*, p. 153 bottom (2013); N. Hoffman, A. Brown & J. Brown, *Orchids of south-west Australia*, 4th edn. p. 162 (2019); A. Brown, *The complete orchids of Western Australia*, vol. 1, p. 153 (2022) [all as *C. flava* subsp. ‘late red’].

Plants solitary or in loose colonies. *Leaf* 110–130 mm long, 9–12 mm wide, obliquely ascending, broadly linear, flattened in TS, the upper surface pale green with the basal 1/3 irregularly blotched red-purple, the lower surface green suffused with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 60–100 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract half way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–3, 25–35 mm across, golden yellow and white with prominent red spots, lines and markings on the dorsal sepal and petals; floral odour unknown. *Sepals* and *petals* stiffly held, broadly lanceolate, the apex shortly acute and lacking a swollen osmophore. *Dorsal sepal* 15–20 mm long, 5–7 mm wide, erect, bright red with golden yellow to white margins. *Lateral sepals* 17–28 mm long, 6–10 mm wide, spreading horizontally to obliquely downwards, golden yellow occasionally becoming white apically, usually lacking red spots and markings. *Petals* shorter than the sepals, 14–18 mm long, 6–8 mm wide, spreading obliquely upwards, golden yellow to white with prominent red spots, lines and markings. *Labellum* prominently 3-lobed, creamy yellow basally, terminating in a white horizontally projecting apex, stiffly articulate on a claw *c.* 1–1.5 mm wide; lamina hastate with lateral lobes projecting obliquely forward in outline when flattened, 8–10 mm long, 8–10 mm wide when flattened, basal 1/5 curving from erect to horizontal, apical 4/5 horizontal except for lateral lobes, margins at widest point deeply curved upwards and terminated by vertically ascending calli 1–1.5 mm long; lateral lobes falcate, acute, with entire proximal margins, distal margins entire or fimbriate with few linear narrowly capitate obliquely ascending forward-facing calli to 2 mm long; midlobe margins fimbriate proximally with 2 pairs of linear narrowly capitate obliquely ascending to horizontal forward-facing calli to 3 mm long, becoming entire towards the acute apex. *Lamina calli* in 3 or 4 pairs held aloft in a semicircular or horseshoe pattern on the perimeter of a

callus plate which is spherical to oblong when viewed from above, extending about 1/3 the length of the lamina, erect to forward-facing, linear, acute, equal in length, to 3 mm, golden yellow, broadening and connate at base. *Column* 7–10 mm long, 4–5 mm wide, broadly winged, lacking auricular lobes, golden yellow. *Anther* 1.5–1.5 mm long, 1.5–1.5 mm wide, golden yellow often becoming red apically, apex caudate. *Pollinia* c. 1 mm long, aggregated in 4–7 broadly club-shaped united segments, yellow. *Stigma* horizontally elliptical, c. 2 mm wide, greenish yellow. Capsule not seen. (Figure 4 A)



Figure 4. *Caladenia flava* subsp. *secunda*. A – whole plant; Unvouchered. B – dry wandoo habitat. Photographs: G. Brockman.

Diagnostic features. *Caladenia flava* subsp. *secunda* can be distinguished from all other subspecies of *C. flava* by the following combination of characters: Scape 60–100 mm high. Flowers golden yellow and white with prominent bright red spots, lines and markings on the dorsal sepal and petals. Sepals and petals stiffly held, broadly lanceolate, the apex shortly acute and lacking a swollen osmophore. Labellum creamy yellow basally, terminating in a white horizontally projecting apex. Lamina calli in 3 or 4 pairs held aloft in a semicircular or horseshoe pattern on the perimeter of a callus plate.

Other specimens examined. WESTERN AUSTRALIA: Luptons Nature Reserve, 2.9 km S of Woods Loop, S of Brookton Highway, 13 Oct. 2005, *G. Brockman* GBB 1661 (PERTH); Strange Road Reserve, Strange Road, S of Brookton Highway, 13 Oct. 2005, *G. Brockman* GBB 1665 (PERTH); Ramsay Road, 4.4 km S off Woods Loop which joins Brookton Highway, 20 km W of Brookton, edge of Luptons Nature Reserve, 10 Oct. 2006, *G. Brockman* GBB 1965 (PERTH); Bartram Road Nature Reserve, Bartram Road, 2 km N of Brookton Highway, 20 km W of Brookton, 5 Oct. 2008, *G. Brockman* GBB 2380 (PERTH); Brookton Highway, 110 km peg, Brookton Highway Nature Reserve, 1 km W of Bartram Road, W of Brookton, 27 Sep. 2010, *G. Brockman* GBB 2656 (PERTH); Wearne State Forest, Ricks Road, Wandering, 3.03 km W of South Road, 6 Oct. 2014, *F. Hort* FH 3877 (PERTH).

Distribution and habitat. Found between York and Williams, growing in open *Eucalyptus wandoo* woodland in lateritic loams on hill slopes and in sandy clay soils along the margins of seasonal creeklines (Figure 4B). Associated orchid species include *Pterostylis ciliata*, *P. sargentii* and *Thelymitra graminea*. The subspecies is often locally common.

Phenology. Flowering late September to early November.

Conservation status. Widespread and often locally common in areas of State Forest including Flint, Gibbs, Bannister and Wearne and Conservation Reserves including Brookton Highway, Westdale, Boyagin, Luptons, Weam, Pingeculling, Horne and Dryandra. These locations are derived from both herbarium collections and the authors' personal records compiled during field trips.

Etymology. From the Latin *secunda* (following, next, second), alluding to its flowering after the typical subspecies has finished in areas where these taxa grow near to one another.

Common name. Brookton Highway Cowslip Orchid.

Affinities. *Caladenia flava* subsp. *secunda* is distinguished from *C. flava* subsp. *flava* in its shorter flower scapes that are usually below 100 mm high (*cf.* usually above 100 mm high), predominantly red dorsal sepal and petals with yellow markings (*cf.* predominantly yellow with red markings) and, where the two taxa grow near one another, later flowering period from late September to early November (*cf.* July to September). The habitat of *C. flava* subsp. *secunda* is open *Eucalyptus wandoo* woodland whereas *C. flava* subsp. *flava* has a preference for *Eucalyptus marginata*, *Corymbia calophylla* forests, *Allocasuarina* thickets, soil pockets on granite outcrops and dense shrublands. While they occur in the same general area as one another, the two subspecies do not share the same habitat preferences.

Caladenia flava subsp. *secunda* is distinguished from *C. flava* subsp. *maculata* in its prominently red-striped dorsal sepal and petals (*cf.* red-spotted), lateral labellum calli in 2 pairs (*cf.* 4–8 pairs) and later flowering period from late September to early November (*cf.* July to early September). The two subspecies are well separated geographically.

Caladenia flava subsp. *secunda* is distinguished from *C. flava* subsp. *sylvestris* in having a shorter flower scape 60–100 mm high (*cf.* 120–300 mm high) and golden yellow and white flowers with prominent red markings (*cf.* pale yellow and white with pale red markings). *Caladenia flava* subsp. *secunda* also occurs in lower rainfall, more northerly, inland habitat (*cf.* high rainfall south-westerly habitat). The two subspecies are well separated geographically.

Caladenia flava subsp. *secunda* is distinguished from *C. flava* subsp. *albescens* (formally described elsewhere in this paper) by its smaller, golden yellow, prominently red-marked flowers 25–35 mm across (cf. 35–45 mm across and pale yellow suffusing into white with few if any red markings) and lamina calli in 3 or 4 pairs (cf. 5 or 6 pairs). *Caladenia flava* subsp. *secunda* inhabits open *Eucalyptus wandoo* woodland along the western edge of the wheatbelt whereas *C. flava* subsp. *albescens* is restricted to *Eucalyptus marginata*, *Corymbia calophylla* forests on the Darling Scarp.

Caladenia haemantha G.Brockman & A.P.Br., *sp. nov.*

Type: [precise locality withheld for conservation reasons] Bencubbin-Kellerberrin Road, north of Kellerberrin, Western Australia, 8 August 2014, G. Brockman GBB 3297 (*holo*: PERTH 08879400).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 115 (2022), as *Caladenia* sp. ‘Kellerberrin’.

Plants solitary or in small to large clumps. *Leaf* 65–100 mm long, 2–4 mm wide, linear, erect, incurved in TS, pale green, the basal 1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 170–250 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract 1/2–2/3 way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–3, 50–70 mm across, uniformly blood-red to pinkish red with maroon stripes and blotches; floral odour faint, like burning metal. *Sepals* and *petals* linear-lanceolate in the basal 1/3–2/5 then abruptly narrowing before terminating in a blood-red or pinkish red, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 35–60 mm long, 1.5–2.5 mm wide, erect to slightly incurved. *Lateral sepals* 40–60 mm long, 2–3 mm wide, spreading horizontally near the base before curving obliquely downwards. *Petals* shorter than the sepals, 35–45 mm long, 1.5–2.5 mm wide, spreading horizontally near the base before curving obliquely downwards. *Labellum* obscurely 3-lobed, blood-red or pinkish red with prominent blood-red stripes, stiffly articulated on a claw 1–1.5 mm wide; lamina 7–8 mm long, 3.5–6 mm wide, linear rhomboidal to narrowly-triangular in outline when flattened, erect with entire margins in the basal 1/3, nearly horizontal in the middle 1/3 and prominently recurved in the apical 1/3; lateral lobes moderately curved upwards with truncate to triangular, forwardly uncinatate, blood-red, pinkish red or creamy white marginal calli > 1 mm long that are decrescent towards the apex; lamina calli blood-red or pinkish red in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum, anvil shaped, the longest c. 0.5 mm tall, decrescent towards the apex. *Column* 5–7 mm long, 2–3 mm wide, broadly winged, uniformly blood-red to creamy white with red blotches and suffusions, outer surface sparsely hirsute with short glandular hairs, inner surface with sparse short glandular hairs in the basal half only. *Anther* 1–1.5 mm long, 1–1.5 mm wide, yellow to greenish yellow. *Pollinia* c. 1 mm long, kidney shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, c 1.5 mm wide, greenish yellow. *Capsule* not seen. (Figure 5)

Diagnostic features. *Caladenia haemantha* may be distinguished from all other members of the genus by the following combination of characters: Flowers blood-red or pinkish red with maroon stripes and blotches; lateral sepals and petals spreading horizontally near the base before curving obliquely downwards; petals shorter than the sepals; labellum lamina 7–8 mm long, 3.5–6 mm wide, blood-red, pinkish red or creamy white with prominent blood-red stripes; lateral lobes moderately curved upwards with truncate to triangular, forwardly uncinatate, blood-red or pinkish red marginal calli; lamina calli blood-red, pinkish red or creamy white in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum; labellum apex prominently recurved.

Other specimens examined. WESTERN AUSTRALIA: [precise locality withheld for conservation reasons] Bencubbin-Kellerberrin Road, N of Kellerberrin, 20 Aug. 2024, G. Brockman GBB 4624 (PERTH).

Phenology. Flowering August to early September.



Figure 5. *Caladenia haemantha*. A – whole plants showing clumping habit; B – labellum details. Voucher: G. Brockman GBB 4524. Photographs: G. Brockman.

Distribution and habitat. Found north of Kellerberrin and north and south Tammin, growing in seasonally damp sandy clay soil above drainage lines in open *Eucalyptus loxophleba* woodland with *Acacia* and *Hakea* species.

Conservation status. To be listed as Priority Two under Conservation Codes for Western Australian Flora (Tanya Llorens pers. comm.). *Caladenia haemantha* is known from two vouchered populations north of Kellerberrin and two currently unvouchered populations north and south of Tammin. Two populations occur in Nature Reserves, one on a road reserve and another on private property.

Etymology. From the Greek *haemanthus* (blood-red), in reference to the blood-red flowers.

Common name. Kellerberrin Spider Orchid.

Affinities. *Caladenia haemantha* appears most similar in morphology to *C. filifera* Lindl. and like that species has blood-red flowers. *Caladenia haemantha* is, however, distinguished from *C. filifera* in its more stiffly held petals and lateral sepals that curve obliquely downwards (cf. petals and lateral sepals pendulous), shorter petals 35–45 mm long (cf. 50–100 mm long), smaller labellum 7–8 mm long, 3.5–6 mm wide (cf. 10–15 mm long, 6–10 mm wide) and usually shorter column 5–7 mm long (cf. 5–9 mm long). These two species are well separated geographically with *C. haemantha* found some 90 km east of the nearest known population of *C. filifera*.

Caladenia lawsonii G.Brockman & A.P.Br., *sp. nov.*

Type: 7.8 km W of Pardelup Road on Muir Hwy (7.5 km from Hay River), 250 m N of the highway on the W end of the forest block, Western Australia, 18 September 2015, R. Phillips RDP 0324 (*holo:* PERTH 08739765).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 173 (2022), as *Caladenia* sp. ‘sedges’.

Plants solitary or in small clumps. *Leaf* 80–170 mm long, 5–10 mm wide, linear, erect, incurved in TS, pale green, the basal 1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 200–550 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract half way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–3, 50–80 mm across, pale lemon-yellow to creamy yellow occasionally with pale brown to maroon stripes and blotches; floral odour faintly sweet. *Sepals* and *petals* linear-lanceolate in the basal 1/3–2/5 then abruptly narrowing before terminating in a greenish yellow to pale brown, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 40–75 mm long, 2.5–3 mm wide, erect to slightly incurved. *Lateral sepals* 40–75 mm long, 3–5 mm wide, spreading horizontally near the base and pendulous to sub-pendulous towards the apex. *Petals* shorter than the sepals, 35–45 mm long, 2.5–3 mm wide, spreading horizontally near the base and spreading obliquely downwards or pendulous to sub-pendulous towards the apex. *Labellum* obscurely 3-lobed, white to creamy white with pale brown to maroon stripes and blotches, stiffly articulated on a claw 1.5–2.5 mm wide; lamina 12–15 mm long, 8–10 mm wide, linear cordate in outline when flattened, erect with entire margins in the basal 1/3, nearly horizontal in the middle 1/3 and prominently recurved in the apical 1/3; lateral lobes with forward-facing, brown to maroon, often white-tipped, narrowly apically thickened marginal calli > 3 mm long, decrescent towards the apex; lamina calli brown to maroon, often white-tipped, hockey stick-shaped, the longest c. 1 mm tall, in 4–6 longitudinal rows extending at least 3/4 the length of the labellum, decrescent towards the apex. *Column* 11–12 mm long, 5–6 mm wide, broadly-winged, creamy yellow to greenish yellow with brown to maroon blotches and suffusions. *Anther* 2–2.5 mm long, 2–2.5 mm wide, yellow to greenish yellow. *Pollinia* c. 2 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, 2–2.5 mm wide, greenish yellow. *Capsule* not seen. (Figures 6A & B)

Diagnostic features. *Caladenia lawsonii* may be distinguished from all other members of the genus by the following combination of characters: Flowers pale lemon-yellow to creamy yellow occasionally with pale brown to maroon stripes and blotches; lateral sepals pendulous to sub-pendulous towards the apex; petals shorter than the sepals and spreading obliquely downwards or pendulous to sub-pendulous towards the apex; labellum white to creamy white with pale brown to maroon stripes and blotches, the lateral lobes with forward facing, brown to maroon, often white-tipped, narrowly apically thickened marginal calli; lamina calli in 4–6 longitudinal rows; labellum apex prominently recurved.

Other specimens examined. WESTERN AUSTRALIA: Tootanellup, c. 900 m S along east boundary from Rocky Gully Road then c. 70 m W into bush, 30 Aug. 2013, J. Liddelow JAL 185 (PERTH).

Phenology. Flowering late August to early October.

Distribution and habitat. Found between Tonebridge and Mount Barker, growing in sandy clay soils in seasonally wet flats and drainage lines. Habitat comprises open *Eucalyptus occidentalis* woodland over scattered *Acacia rostellifera*, *Hakea prostrata*, *Hypocalymma angustifolium*, *Sowerbaea multiflorus* and sedges (Figure 5C).

Conservation status. Not considered under immediate threat. *Caladenia lawsonii* is known from seven widely separated populations, three of which are in nature reserves.



Figure 6. *Caladenia lawsonii*. A – whole flower. B – labellum details; C – habitat. Unvouchered. Photographs: G. Brockman (A, B), C.J. French (C).

Etymology. Named for David Lawson (1966–) who recognised this species as distinct and brought it to our attention.

Common name. Sedge Spider Orchid.

Affinities. *Caladenia lawsonii* appears most similar in morphology to *C. christineae* Hopper & A.P.Br. and was at one time thought to be a form of that species. It is, however, distinguished from *C. christineae* by its pale lemon-yellow to creamy yellow flowers (*cf.* white), pendulous to sub-pendulous lateral sepals (*cf.* spreading obliquely downwards), shorter labellum 12–15 mm long (*cf.* 15–18 mm long), shorter column 11–12 mm long (*cf.* 13–16 mm long) and earlier flowering period between late August and early October (*cf.* October to early November). *Caladenia lawsonii* is in late flower or finished by the time *C. christineae* begins flowering. Although distributions overlap, these two species have not been found growing together.

Caladenia lawsonii also has affinities with *C. swartsiorum* A.P.Br. & G.Brockman, sharing with that species a late August to early October flowering period, pale lemon-yellow to creamy yellow flowers and a preference for seasonally damp habitat. *Caladenia lawsonii* is, however, distinguished from *C. swartsiorum* by its smaller flowers 50–80 mm across (*cf.* 80–100 mm across), shorter petals 35–45 mm long (*cf.* 50–70 mm long), shorter labellum 12–15 mm long (*cf.* 16–21 mm long) and shorter column 11–12 mm long (*cf.* 15–18 mm long). These two species are well separated geographically with *Caladenia lawsonii* found some 170 km south-east of the distribution of *C. swartsiorum*.

***Caladenia longicauda* Lindl. subsp. *nematilis* G.Brockman & A.P.Br., subsp. nov.**

Type: [precise locality withheld for conservation reasons] Pallinup [Pallarup] Rock, Newdegate-Ravensthorpe Road, north of Ravensthorpe, Western Australia, 26 September 2016, G. Brockman GBB 3515 (*holo*: PERTH 08879109; *iso*: AD, CANB).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 169 (2022), as *Caladenia longicauda* subsp. ‘Pallarup’.

Plants solitary or in small clumps. *Leaf* 100–250 mm long, 5–10 mm wide, linear, erect, incurved in TS, pale green, the basal 1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 200–550 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract half way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–3, 50–80 mm across, pale lemon-yellow to creamy yellow occasionally with pale brown to maroon stripes and blotches; floral odour faintly sweet. *Sepals* and *petals* linear-lanceolate in the basal 1/3–2/5 then abruptly narrowing before terminating in a greenish yellow to pale brown, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 40–75 mm long, 2.5–3 mm wide, erect to slightly incurved. *Lateral sepals* 40–75 mm long, 3–5 mm wide, spreading horizontally near the base and pendulous to sub-pendulous towards the apex. *Petals* shorter than the sepals, 35–65 mm long, 2.5–3 mm wide, spreading horizontally near the base and pendulous to sub-pendulous towards the apex. *Labellum* obscurely 3-lobed, white to creamy white with pale brown to maroon stripes and blotches, stiffly articulated on a claw 1.5–2.5 mm wide; lamina 12–15 mm long, 8–10 mm wide, linear cordate in outline when flattened, erect with entire margins in the basal 1/3, nearly horizontal in the middle 1/3 and prominently recurved in the apical 1/3; lateral lobes with forward facing, brown to maroon, often white-tipped, narrowly apically thickened marginal calli > 3 mm long, decrescent towards the apex; lamina calli brown to maroon, often white-tipped, hockey stick-shaped, the longest c. 1 mm tall, in 4–6 longitudinal rows extending at least 3/4 the length of the labellum, decrescent towards the apex. *Column* 11–12 mm long, 5–6 mm wide, broadly winged, creamy yellow to greenish yellow with brown to maroon blotches and suffusions. *Anther* 2–2.5 mm long, 2–2.5 mm wide, yellow to greenish yellow. *Pollinia* c. 2 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, c. 2.5 mm wide, greenish yellow. *Capsule* not seen. (Figure 7)

Diagnostic features. *Caladenia longicauda* subsp. *nematilis* may be distinguished from all other subspecies of *C. longicauda* by the following combination of characters: flowers pale lemon-yellow to creamy yellow occasionally with pale brown to maroon stripes and blotches; lateral sepals pendulous to sub-pendulous towards the apex; petals shorter than the sepals and spreading obliquely downwards or pendulous to

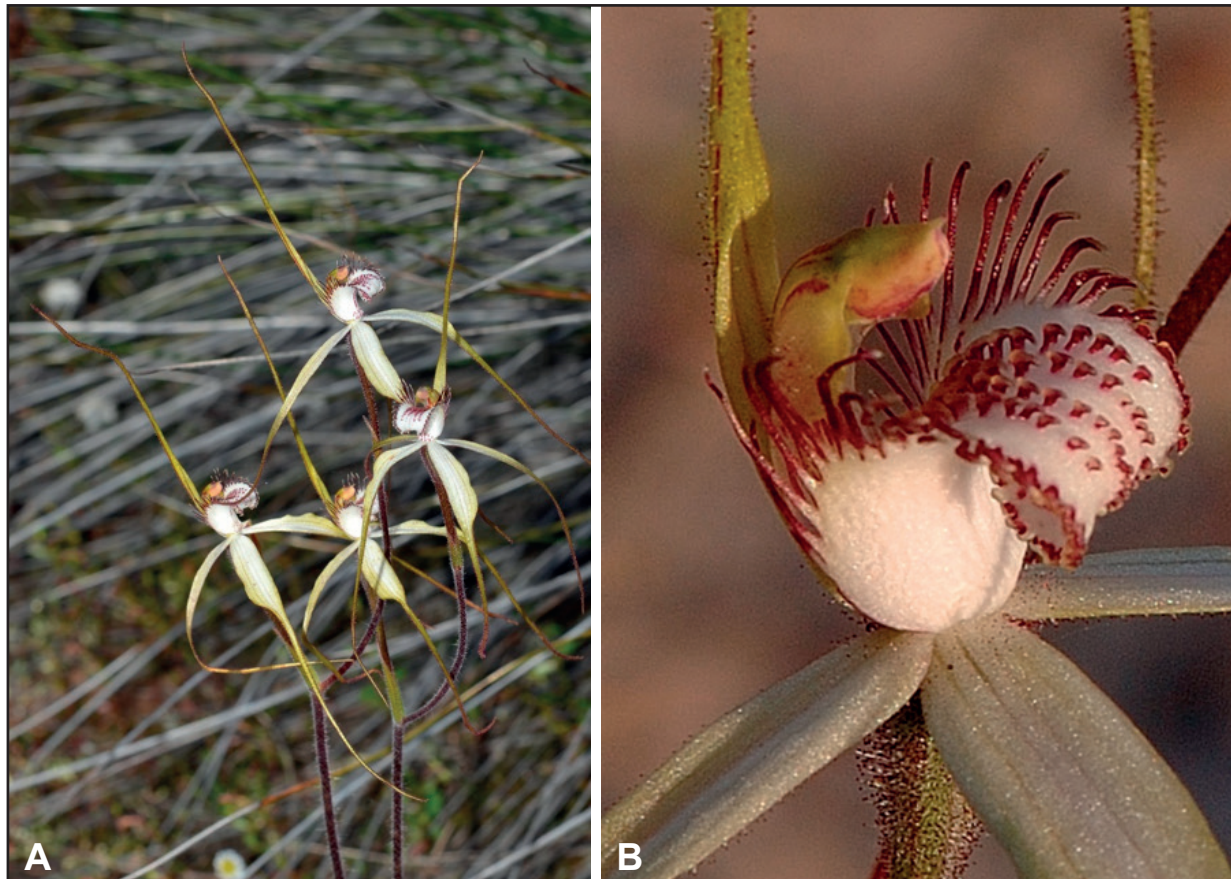


Figure 7. *Caladenia longicauda* subsp. *nematilis*. A – flowers; B – labellum detail. Voucher: G. Brockman GBB 3515. Photographs: G. Brockman.

sub-pendulous towards the apex; labellum white to creamy white with pale brown to maroon stripes and blotches, the lateral lobes with forward-facing, brown to maroon, often white-tipped, narrowly apically thickened marginal calli; lamina calli in 4–6 longitudinal rows; labellum apex prominently recurved.

Other specimens examined. WESTERN AUSTRALIA: [precise locality withheld for conservation reasons] Mt Madden Junior, D.L. Jones 12336 (CANB).

Phenology. Flowering September to mid-October.

Distribution and habitat. Found over a narrow geographic range north of Ravensthorpe, growing in sandy soil in *Eucalyptus* and *Allocasuarina* woodland surrounding granite outcrops.

Conservation status. To be listed as Priority Three under Conservation Codes for Western Australian Flora (Tanya Llorens pers. comm.). Although not considered under immediate threat the subspecies is known from less than 200 plants over a restricted range between Pallarup Rocks and Mt Madden.

Etymology. From the Latin *nemus* (wood, forest) and *-atilis* (belonging to, dwelling in), alluding to the habitat of this subspecies.

Common name. Pallarup White Spider Orchid.

Affinities. *Caladenia longicauda* subsp. *nematilis* has affinities with *C. longicauda* subsp. *rigidulus* Hopper & A.P.Br. with which it was previously placed. It is, however, distinguished from that subspecies by its longer, pendulous to sub-pendulous lateral sepals 40–75 mm long (*cf.* stiffly spreading and 35–60 mm long) and longer, pendulous to sub-pendulous petals 35–65 mm long, (*cf.* stiffly spreading and 28–50 mm long).

Caladenia longicauda subsp. *nematilis* has affinities with *C. longicauda* subsp. *australora* Hopper & A.P.Br. but has a shorter labellum 15–20 mm long (cf. 18–25 mm long) and shorter labellum lateral fringing under 5 mm long (cf. 4–7 mm long). Habitats also differ with *C. longicauda* subsp. *nematilis* found in sandy soil in inland *Eucalyptus* and *Allocasuarina* woodland (cf. calcareous sands and sandy loams in coastal low *Eucalyptus* woodland and *Melaleuca* shrubland).

Caladenia longicauda subsp. *nematilis* also has affinities with *C. longicauda* subsp. *extrema* A.P.Br. & G. Brockman but is readily distinguished by its earlier flowering period from September to mid-October (cf. late October to mid-November) and well-drained sandy woodland habitat (cf. seasonal dampland and moist creekline margins). The two subspecies are geographically well separated.

***Caladenia primotina* G.Brockman & A.P.Br., sp. nov.**

Type: Kweda, Western Australia [precise locality withheld for conservation reasons], Western Australia, 25 July 2004, G. Brockman GBB 1160 (*holo:* PERTH 07110510; *iso:* NSW 937853).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 85 (2022), as *Caladenia* sp. ‘early wheatbelt’.

Plants solitary or in small to large clumps. *Leaf* 70–140 mm long, 5–8 mm wide, linear, erect, incurved in TS, pale green, the basal 1/5–1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 150–280 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract 1/2 way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–2(3), 60–100 mm across, cream to creamy yellow with pale maroon stripes and markings; floral odour faint, earthy. *Sepals* and *petals* linear-lanceolate in the basal 1/4–1/3 then narrowing before terminating in a red, pinkish red or brown, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 50–80 mm long, 2–2.5 mm wide, erect to slightly incurved. *Lateral sepals* 50–80 mm long, 2–3 mm wide, spreading horizontally near the base and curving obliquely downwards towards the apex, or more rarely pendulous to sub-pendulous. *Petals* shorter than the sepals, 45–70 mm long, 1.5–2 mm wide, spreading horizontally near the base and curving obliquely downwards towards the apex. *Labellum* obscurely 3-lobed, white or pale yellow with pale to dark red stripes and markings, stiffly articulated on a claw 1–1.5 mm wide; lamina 8–12 mm long, 7–8 mm wide, rhomboidal to narrowly-triangular in outline when flattened, erect with entire margins in the basal 1/4–1/3, nearly horizontal in the middle 1/3–1/2 and prominently recurved in the apical 1/4–1/3; lateral lobes moderately curved upwards with truncate, forwardly uncinat, creamy white marginal calli > 1 mm long, decrescent towards the apex; lamina calli creamy white with pale red markings in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum, anvil-shaped, the longest c. 1 mm tall, decrescent towards the apex. *Column* 9–11 mm long, 3–3.5 mm wide, broadly winged, creamy white with red markings and suffusions, outer surface sparsely hirsute with short glandular hairs, inner surface with sparse short glandular hairs in the basal half only. *Anther* 1.5 mm long, 1.5 mm wide, yellow to greenish yellow. *Pollinia* c. 1.5 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, c. 1.5 mm wide, greenish yellow. *Capsule* not seen. (Figure 8)

Diagnostic features. *Caladenia primotina* may be distinguished from all other members of the genus by the following combination of characters: Early flowering period between July and mid-August; flowers 60–100 mm across, cream or creamy yellow; lateral sepals and petals spreading horizontally near the base and curving obliquely downwards towards the apex, or more rarely pendulous to sub-pendulous; petals shorter than the sepals; labellum lamina 8–12 mm long, 7–8 mm wide, white, white or pale yellow with pale to dark red stripes and markings; lateral lamina lobes with truncate, forwardly uncinat, creamy white marginal calli; lamina calli creamy white with pale red markings in 2 longitudinal rows; labellum apex prominently recurved.



Figure 8. *Caladenia primotina*. A – clump of plants; B – labellum details. Voucher: G. Brockman GBB 1160. Photographs: G. Brockman.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 25 July 2004, G. Brockman GBB 1161 (PERTH); 25 July 2004, G. Brockman GBB 1162 (PERTH); 25 July 2004, G. Brockman GBB 1163 (PERTH); 25 July 2004, G. Brockman GBB 1164 (PERTH); 12 Aug. 1998, R. Davis, F. Obbens & L. Sage RD 6450 A (PERTH); 12 Aug. 1998, R. Davis, F. Obbens & L. Sage RD 6450 B (PERTH); 2 Aug. 1999, F. Obbens, R. Davis & L. Sage FO 244/99 (PERTH).

Phenology. Flowering early July to mid-August.

Distribution and habitat. Found over a narrow geographic range between Aldersyde and Corrigin, growing in seasonally damp sandy and sandy clay soil in woodlands and shrublands.

Conservation status. To be listed as Priority Two under Conservation Codes for Western Australian Flora (Tanya Llorens pers. comm.). Although locally common, the species is known from just a few populations, one in a small nature reserve and several in remnant bushland on road reserves. Road reserve populations are threatened by grading, herbicide spraying, vegetation slashing, altered hydrology and adjacent farming activities.

Etymology. From the Latin *primotinus* (early or first), alluding to the early flowering period of this species.

Common name. Early Wheatbelt Spider Orchid.

Caladenia primotina appears most similar in morphology to *C. fluvialis* A.P.Br. & G.Brockman and was at one time thought to be a form of that species. It is, however, distinguished from *C. fluvialis* by its smaller flowers 60–100 mm across (cf. 80–120 mm across) and earlier flowering period between early July and mid-August (cf. mid-August to late September). The distributions of these two species are not

known to overlap with *C. primotina* found some 80 kilometres east of the nearest known population of *C. fluvialis*.

Caladenia primotina also has affinities with *C. polychroma* Hopper & A.P.Br. but is readily distinguished from that species by its less colourful cream to creamy yellow flowers (*cf.* predominantly yellow to dark maroon), shorter, narrower lateral sepals 50–80 mm long, 2–3 mm wide (*cf.* 60–100 mm long, 3–4 mm wide), narrower petals 1.5–2 mm wide (*cf.* 2–3 mm wide), smaller labellum 8–12 mm long, 7–8 mm wide (*cf.* 10–17 mm long, 10–13 mm wide) and smaller column 9–11 mm long, 3–3.5 mm wide (*cf.* 10–13 mm long, 4–6 mm wide). It also has an earlier flowering period than *C. polychroma*, from early July to mid-August (*cf.* late August to October) and a more northerly distribution with no apparent overlap.

Caladenia salina G.Brockman & A.P.Br., *sp. nov.*

Type: Wubin-Gunyidi Road, 5.2 km east of Noble Road, east of Gunyidi, Western Australia, 5 September 2010, G. Brockman GBB 2626 (*holo:* PERTH 08420343; *iso:* CANB).

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 91 (2022), as *Caladenia exilis* subsp. *exilis*.

Plants solitary or in small to large clumps. *Leaf* 25–65 mm long, 2.5–5 mm wide, linear, erect, incurved to flattened in TS, pale green, the basal 1/8 usually irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 60–120 mm tall, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract 1/2 way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–2(3), 60–90 mm across, white to creamy white with faint red stripes and markings; floral odour unknown. *Sepals* and *petals* linear-lanceolate in the basal 1/4–1/3 then narrowing before terminating in a dull red or brown, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepal* 30–60 mm long, 2–2.5 mm wide, erect to slightly incurved. *Lateral sepals* 45–70 mm long, 2–2.5 mm wide, spreading horizontally near the base and curving obliquely downwards towards the apex or, more rarely, pendulous to sub-pendulous. *Petals* 45–60 mm long, 1.5–2.5 mm wide, and curving obliquely upwards or, more rarely, spreading horizontally near the base before curving obliquely downwards towards the apex. *Labellum* obscurely 3-lobed, creamy white with pale to dark red stripes and markings, stiffly articulated on a claw 1.5–2 mm wide; lamina 6–8 mm long, 4–6 mm wide, rhomboidal to narrowly-triangular in outline when flattened, erect with entire margins in the basal 1/4–1/3, nearly horizontal in the middle 1/3–1/2 and prominently recurved in the apical 1/4–1/3; lateral lobes moderately curved upwards with truncate, forwardly uncinat, creamy white marginal calli > 0.5 mm long, decrescent towards the apex; lamina calli glossy on top, creamy white or sometimes with pale red markings in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum, anvil-shaped, the longest *c.* 1 mm tall, decrescent towards the apex. *Column* 9–11 mm long, 2–3 mm wide, broadly winged, creamy white to greenish yellow with pale red markings and suffusions, outer surface sparsely hirsute with short glandular hairs, inner surface with sparse short glandular hairs in the basal half only. *Anther* 2 mm long, 2 mm wide, yellow to greenish yellow. *Pollinia* *c.* 2 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, *c.* 2 mm wide, greenish yellow. *Capsule* not seen. (Figure 9)

Diagnostic features. *Caladenia salina* may be distinguished from all other members of the genus by the following combination of characters: Flowers one to two, rarely three, 60–90 mm across, white to creamy white with faint red stripes and markings, sepals and petals with a densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore, labellum lamina 6–8 mm long, 4–6 mm wide, creamy white with pale to dark red stripes and markings, marginal lamina calli > 0.5 mm long, creamy white, truncate and forwardly uncinat. Occupies rises above salt lakes in the north-eastern agricultural region of Western Australia.



Figure 9. *Caladenia salina*. A – plants; B – labellum details; Voucher: *G. Brockman* GBB2866. Photographs: G. Brockman.

Other specimens examined. WESTERN AUSTRALIA: lake system c. 20 km E of Gunyidi, 5 Aug. 1989, *A.P. Brown* 959A (PERTH); Old [Dampierwah] State Farm, NE Perenjori, 20 Aug. 1998, *G. Brockman* GBB 399 (PERTH); Wubin-Gunyidi Road, 5.2 km E of Noble Road, E of Gunyidi, 10 Aug. 2009, *G. Brockman* GBB 2430 (PERTH); Miamoon Rock, Gunyidi-Wubin Road, c. 25 km E of Wubin, 7 Sep. 2010, *G. Brockman* GBB 2461 (PERTH); On E side of Great Northern Highway, 19.2 km S of Pithara, 11 Aug. 2012, *G. Brockman* GBB 2866 (PERTH); Gunyidi-Wubin Road, 2.7 km W of Mason Road, c. 43 km NW of Dalwallinu, 23 Aug. 1988, *S.D. Hopper* 6501 (PERTH).

Phenology. Flowering early August to mid-September. The species is common following good winter rainfall but may be rare or absent in drier years.

Distribution and habitat. Found between Gunyidi, Wubin and Pithara in the northern wheatbelt of Western Australia, growing in tall shrublands on sandy rises above salt lakes and also, more rarely, on nearby granite outcrops.

Conservation status. Common and known from a number of locations in the northern wheatbelt of Western Australia including conservation reserves at Miamoon, Gunyidi and South Pithara. Habitat is mostly unsuitable for agriculture due to it being wedged amongst large salt lakes.

Etymology. From the Latin *salina* (salt), alluding to the habitat of the species which is associated with salt lakes.

Common name. Salt Lake Spider Orchid.

Affinities. *Caladenia salina* was previously considered a form of *C. exilis* Hopper & A.P.Br. It is, however, distinguished from that species by its larger flowers 60–90 mm across (*cf.* 40–70 mm across), usually

more stiffly held petals and sepals (*cf.* pendulous to sub-pendulous) and smaller labellum 6–8 mm long, 4–6 mm wide (*cf.* 8–12 mm long, 5–7 mm wide). The two species are well separated geographically and occur in different habitats.

Caladenia salina has affinities with *C. varians* Hopper & A.P.Br. but differs in having more stiffly held petals and sepals (*cf.* pendulous) and a smaller labellum 6–8 mm long, 4–6 mm wide (*cf.* 10–15 mm long, 7–11 mm wide).

Notes. *Caladenia* × *hopperi* J.M.H.Shaw was formally named from a hybrid between *C. drakeoides* Hopper & A.P.Br. and what was at that time considered the northern form of *C. exilis* Hopper & A.P.Br. In this paper we formally split *C. exilis* into two species with the northern form now placed in the new species *C. salina*. Consequently, the parents of *C.* × *hopperi* now comprise *C. drakeoides* × *C. salina*.

Caladenia silvicola G.Brockman & A.P.Br., *sp. nov.*

Type: Proposed Wandoo National Park, West Talbot Road, York, c. 1.25 km south-east of Deefor Road to Beekeeper Road, mainly on west side of road, Western Australia, 6 September 2004, *F. Hort* 2303 (*holo:* PERTH 06909760; *iso:* CANB).

Caladenia sp. Wandoo (G. Brockman GBB 671), Western Australian Herbarium, in *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed 26 November 2025].

Illustrations. A.P. Brown, *The complete orchids of Western Australia*, vol. 1, p. 101 (2022), as *Caladenia* sp. ‘Wandoo’.

Plants solitary or in small clumps. *Leaf* 70–130 mm long, 3–5 mm wide, linear, erect, incurved in TS, pale green, the basal 1/5–1/3 irregularly blotched with red-purple, densely hirsute with patent eglandular trichomes > 3 mm long with expanded barrel-shaped basal cells. *Scape* 140–240 mm high, hirsute with patent eglandular trichomes similar to those on the leaf, erect, wiry, with an erect sheathing, acuminate, externally hirsute cauline bract 1/2 way up and a similarly shaped floral bract under each pedicel. *Flowers* 1–2(-3), 50–80 mm across, pale creamy yellow (more rarely cream) with pale maroon stripes and markings; floral odour unknown. *Sepals* and *petals* linear-lanceolate in the basal 1/4–1/3 then narrowing before terminating in a maroon, brown or black, densely glandular, long-acuminate, filamentous apex, lacking a swollen osmophore. *Dorsal sepals* 60–80 mm long, 2 mm wide, erect to slightly incurved. *Lateral sepals* 70–90 mm long, 2–3 mm wide, spreading horizontally near the base before curving obliquely downwards and becoming sub-pendulous to pendulous towards the apex. *Petals* shorter than the sepals, 60–80 mm long, 2 mm wide, spreading horizontally near the base before curving obliquely downwards and becoming sub-pendulous to pendulous towards the apex. *Labellum* obscurely 3-lobed, white with pale to dark maroon radiating stripes and markings, stiffly articulated on a claw 1–2 mm wide; lamina 11–13 mm long, 8–10 mm wide, rhomboidal to narrowly triangular in outline when flattened, erect with entire margins in the basal 1/4–1/3, nearly horizontal in the middle 1/3–1/2 and prominently recurved in the apical 1/4–1/3; lateral lobes moderately curved upwards with serrate to truncate, forwardly uncinat, creamy white to creamy yellow marginal calli > 1 mm long that are decrescent towards the apex; lamina calli anvil-shaped, the longest c. 1.2 mm tall, glossy on top, creamy white to creamy yellow with pale maroon markings, in 6–8 pairs in 2 longitudinal rows extending at least 1/2 the length of the labellum, decrescent towards the apex. *Column* 8–10 mm long, 3–4 mm wide, broadly winged, creamy white with pale maroon markings and suffusions, outer surface sparsely hirsute with short glandular hairs, inner surface with sparse short glandular hairs in the basal half only. *Anther* 2.5–3 mm long, 2.5–3 mm wide, greenish yellow. *Pollinia* c. 2.5–3 mm long, kidney-shaped, flat, yellow, mealy. *Stigma* horizontally elliptical, c 2.5–3 mm wide, greenish yellow. *Capsule* not seen. (Figure 10)

Diagnostic features. *Caladenia silvicola* may be distinguished from all other members of the genus by the following combination of characters: Flowers 50–80 mm across, pale creamy yellow (more rarely



Figure 10. *Caladenia silvicola*. A – clump of plants; B – labellum details. Unvouchered. Photographs: G. Brockman.

cream) with pale maroon stripes and markings; lateral sepals and petals spreading horizontally near the base before curving obliquely downwards and becoming sub-pendulous to pendulous towards the apex; petals shorter than the sepals; labellum lamina 11–13 mm long, 8–10 mm wide, white with pale to dark maroon radiating stripes and markings; lateral lamina lobes moderately curved upwards with serrate to truncate, forwardly uncinate, creamy white to creamy yellow marginal calli; anvil-shaped, the longest c. 1.2 mm tall, glossy on top, creamy white to creamy yellow with pale maroon markings, in 6–8 pairs in 2 longitudinal rows; labellum apex prominently recurved.

Other specimens examined. WESTERN AUSTRALIA: private property, 8 km S of Pingelly, E side of railway line, 2 Sep. 1995, *D. Box* 63 (PERTH); Dale West Bin Road [Dalebin North Road], 200 m N of Beverley Road, 19 Sep. 2000, *G. Brockman* GBB 671 (PERTH); Dale West Bin Road, 200 m N of Westdale-Beverley Road, 60 m E of road in low flats, 26 Sep. 2003, *G. Brockman* 1008 (PERTH); Talbot West Road, York, c. 200 m NNW of Beekeeper Road, N end, 6 Sep. 2003, *F. Hort* 2030 (PERTH); Proposed Wandoo National Park, Helena Road, York, c. 1.5 km W of Catchment Road, on N side of road, 11 Sep. 2004, *F. Hort & B. Hort* 2304 (PERTH); Ridley Road, Flynn State Forest, York, c. 500 m SE of Yarra Road, 2 Oct. 2004, *F. Hort, J. Hort & J. Shanks* 2301 (PERTH).

Phenology. Flowering late August to September.

Distribution and habitat. Found over a narrow geographic range between York and Pingelly, growing in well drained sand or loam under open *Eucalyptus wandoo*, *E. loxophleba* and scattered *Allocasuarina huegeliana*. Associated species include *Caladenia hirta* subsp. *rosea*, *C. longicauda* subsp. *eminens*, *Diplolaena graniticola* and *Diuris corymbosa*.

Conservation status. Although known from relatively few populations in State Forest and Shire reserves the species is locally common, especially in the seasons following summer fire.

Etymology. From the Latin *silva* (wood, forest) and *cola* (dweller), alluding to the forest habitat of this species.

Common name. Wandoo Spider Orchid.

Affinities. *Caladenia silvicola* appears most similar in morphology to *C. pendens* Hopper & A.P.Br. but is readily distinguished from that species by its smaller, pale creamy yellow flowers 50–80 mm across (*cf.* 70–100 mm across and creamy white or red), shorter lateral sepals 70–90 mm long (*cf.* 80–120 mm long), shorter petals 60–80 mm long (*cf.* 70–120 mm long) and usually narrower labellum 8–10 mm wide (*cf.* 9–12 mm wide). *Caladenia silvicola* also occurs in more upland habitat in drier soils.

Caladenia silvicola has affinities with *C. polychroma* Hopper & A.P.Br. but is distinguished from that species by its smaller, less colourful, pale creamy yellow flowers 50–80 mm across (*cf.* 80–120 mm across and white, yellow or dark maroon), usually pendulous to sub-pendulous petals and lateral sepals (*cf.* petals and lateral sepals spreading) and more northerly distribution with no apparent overlap.

Caladenia silvicola sometimes occurs with the more distantly related *C. filifera* Lindl. but is distinguished from that species by its pale creamy yellow rather than blood-red flowers and shorter, often less distinctly pendulous petals and lateral sepals.

There are no recorded hybrids between *Caladenia silvicola* and any of these species.

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