

***Caesia arcuata* (Hemerocallidaceae) from Western Australia,  
a new rarity with curved inflorescence branches**

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**SHORT COMMUNICATION**

The new species of *Caesia* R.Br. described below was first collected by Woodman Environmental Consulting during an environmental survey near Hopetoun in 2005 and identified initially as *C. viscida* Keighery, a substantial westward range extension for that species. We separately found it at a nearby location in 2010. At that time, we recognised its similarity to *C. viscida*, but considered it a probable new species due to its non-viscid leaves and curved inflorescence branches, a notion that was confirmed upon further study of the two species.

***Caesia arcuata*** T.Macfarlane, Conran & C.J.French, *sp. nov.*

*Type:* Hopetoun, Western Australia [precise locality withheld for conservation reasons], 16 December 2010, T.D. Macfarlane & C.J. French TDM 5228 (*holo:* PERTH 08873976; *iso:* AD, CANB, K, MEL, PERTH 09179860).

*Caesia* sp. Hopetoun (T.D. Macfarlane & C.J. French TDM 5228), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 24 November 2019].

*Perennials*, rhizomatous, forming robust leafy clumps, 35–50 cm high, 35–40 cm wide. *Roots* wiry, tough, sometimes somewhat swollen and narrowly fusiform. *Shoots* numerous, arising from a rootstock 4–5 cm below ground, with persistent older leaf sheaths shredding into tough fibres below ground. *Leaves* several per shoot, mostly basal with 1 or 2 inserted on lower aerial part of stem, 35–45 cm long, 3–7 mm wide when flattened, shorter to slightly longer than inflorescences, narrow at base, broader and linear for most of the length, flat to partly or fully folded, tough, rigid, both surfaces similar, distinctly ridged due to prominent veins, flat to slightly depressed over the midvein adaxially, margins thickened and pale, apex acuminate, glabrous except for low, rounded papillae on the margins and major ridges, not viscid. *Inflorescences* numerous on each plant, paniculate, with branches often becoming entangled, 35–50 cm tall, the peduncle tough, flattened-terete or angular, longitudinally ridged, *c.* 3 mm wide, lower branches subtended by a long, green, leaf-like bract to 14 cm long, subsequent bracts much shorter, to 3 cm long. *Flower-bearing branches (racemes)* to 18 cm long, diverging at a fairly wide

angle, often recurving or arched, with bracts spaced 5–10 mm apart; *bracts* 2–2.5 mm long, triangular, acute, with green to brown central band and membranous margins, subtending 1 or 2 flowers. *Pedicels* 1–2.5 mm long, articulate *c.* 0.75 mm below base of flower, erect in bud, spreading to recurving in flower and fruit. *Flowers* *c.* 6 mm long, perianth white with a dull reddish brown line on outside of segments, twisted together after anthesis; sepals 3, elliptic to oblong, somewhat shouldered in upper part with a small, subterminal, reflexed appendage (tepala apex trichomes *sensu* Macfarlane & Conran 2017) at base of apical point, apical point 0.8 mm long, slightly thickened, acute; petals 3, narrowly oblong-elliptic, apex cucullate, emarginate or notched. *Stamens* 6, inserted on perianth slightly above the base of the segments, antepetaline stamens slightly longer; filaments colliculate, terete, cream or white; anthers slightly unequal (antesepaline ones 0.95 mm long, antepetaline ones 0.85 mm long), broadly ovate, versatile, attached below the middle, dehiscent introrsely by longitudinal slits, yellow. *Ovary* green, ± pyriform, 3-locular; ovules 2 per locule; style single, terminal; stigma punctiform, positioned level with the anthers. *Capsule* leathery, veined, variable in shape depending on the position and number of maturing seeds, loculicidal. *Seeds* 2–2.2 mm diam., ± spherical, shiny black, smooth; aril *c.* 1.8 mm long, fleshy, grooved, rounded, black with whitish areas. (Figure 1)

*Diagnostic features.* *Caesia arcuata* may be distinguished from all other members of the genus by the following combination of characters: roots without discrete tubers, though sometimes somewhat swollen and narrowly fusiform; tough, fibrous, non-viscid leaves; and a paniculate inflorescence that is slightly shorter to longer than the leaves and with curved branches.

*Other specimens examined.* WESTERN AUSTRALIA: [localities withheld for conservation reasons] 9 Oct. 2007, *E.J. Hickman s.n.* (PERTH); 21 Mar. 2018, *T.D. Macfarlane & C.J. French* TDM 6723 (AD, BRI, CANB, MEL, NSW, PERTH (2 sheets), PRE); 3 Oct. 2018, *T.D. Macfarlane & C.J. French* TDM 6791 (AD, BRI, CANB, MEL, NSW, PERTH); 29 Oct. 2005, *G. & D. Woodman* Op 25 (PERTH).

*Phenology.* Flowering from spring to early summer. Fruiting in summer.

*Distribution and habitat.* Currently known from a very limited range near Hopetoun, on the southern coast of Western Australia. It grows in yellow sand or surface grey sand over yellow sand in woodland of *Banksia speciosa*, mallee eucalypts and *Nuytsia floribunda*, apparently favouring valleys or swales. *Caesia arcuata* appears to be more common in areas of soil disturbance (*E.J. Hickman*, pers. comm.) although plants have been observed at a low frequency in undisturbed vegetation.

*Conservation status.* *Caesia arcuata* is listed by Smith and Jones (2018) as Priority One under Conservation Codes for Western Australian Flora, under the name *C. sp.* Hopetoun (*T.D. Macfarlane & C.J. French* TDM 5228). Currently only two populations are known, 2 km apart, neither on conservation reserves.

*Etymology.* The epithet is from the Latin *arcuatus* (curved like a bow), alluding to the shape of the inflorescence branches.

*Vernacular name.* Curved Grass Lily.

*Notes.* *Caesia arcuata* forms part of a group of Western Australian species that have non-tuberous roots, a robust perennial habit, tough leaves and paniculate inflorescences. *Caesia viscida*, another species of the south coastal region, differs from *C. arcuata* in having viscid leaves, an inflorescence half as long as the leaves (vs slightly shorter to longer than the leaves), straight inflorescence branches (vs curved

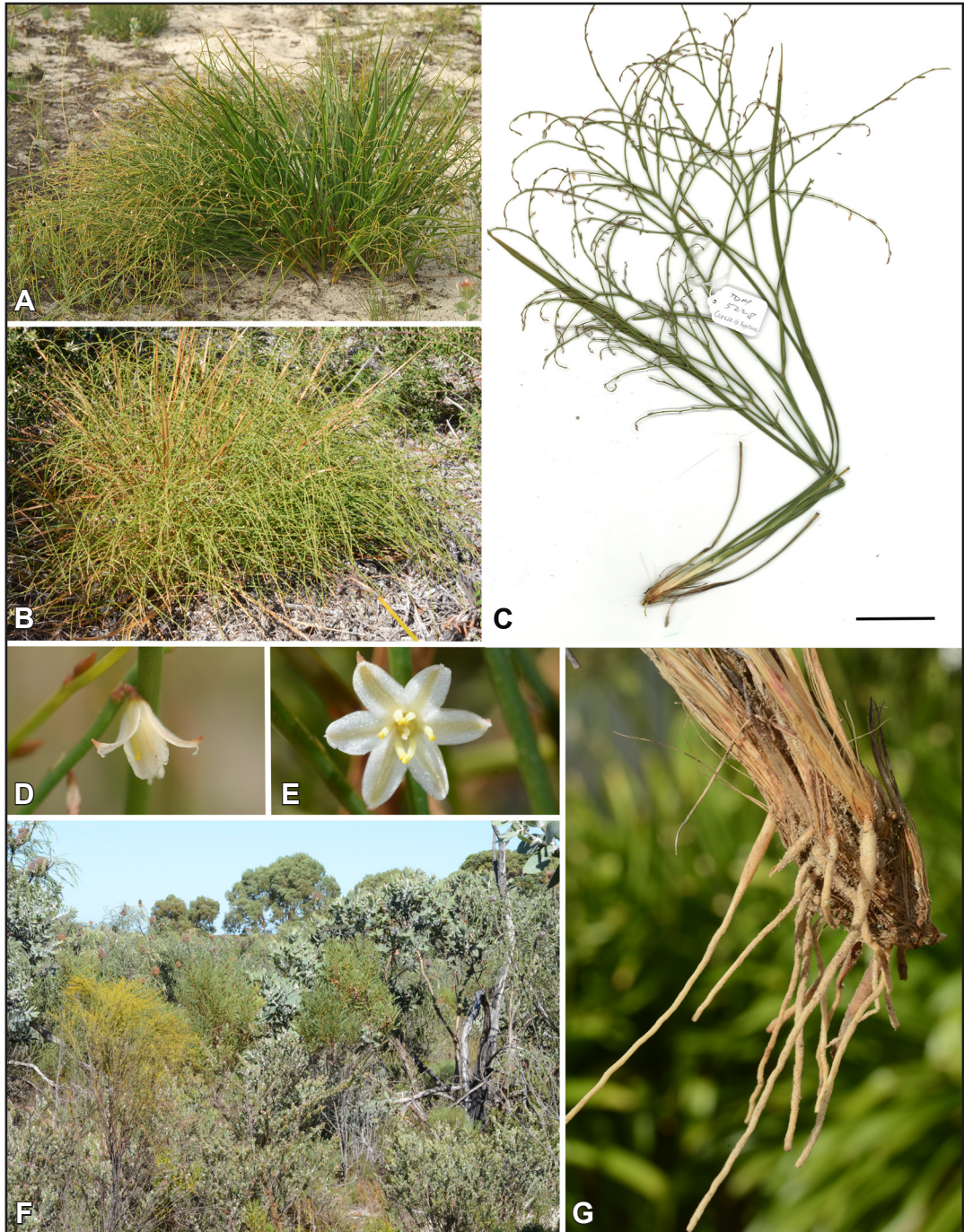


Figure 1. *Caesia arcuata*. A – flowering plant in spring showing the green leaves and numerous inflorescences with curved branches; B – plant in autumn showing the dead leaves and numerous green, post-fruited inflorescences; C – single shoot showing green leaves and paniculate inflorescence with curved branches; D – partially open flower showing apiculate sepal apex and subterminal sepal appendages; E – fully open flower; F – vegetation at type locality; G – roots showing the narrowly fusiform thickening. Scale bar = 1 cm (C). Images from T.D. Macfarlane & C.J. French TDM 5228 (A, C, D), T.D. Macfarlane & C.J. French TDM 6723 (B, E, G) and the type locality (F). Photographs by C.J. French (A, D, E, G); T.D. Macfarlane (B, F); Western Australian Herbarium (C).



branches), smaller flowers (c. 5.2 mm long vs c. 6 mm long) and blunt sepals (vs apiculate sepals). *Caesia rigidifolia* F.Muell. from the Great Victoria Desert differs from *C. arcuata* in having leaves that are more strongly ridged on the abaxial surface with a smooth adaxial surface that is usually concealed by the strong folding of the leaf (vs the adaxial surface ridged like the abaxial surface), thicker and more conspicuously pale yellow leaf margins, and the inflorescences with limited branching. *Caesia* sp. Great Victoria Desert (C. Tauss 2835) differs from *C. arcuata* in having viscid leaves and panicle branches less widely (more acutely) branched.

The seeds of *C. arcuata* have a shape and aril morphology similar to those of *C. viscida* (see Keighery 1990: 134, Figure 1), and resemble those of *Corynotheca* F.Muell. ex Benth. (which are carunculate) rather than those of *Caesia* species such as *C. chlorantha* F.Muell., *C. micrantha* Lindl. and *C. occidentalis* R.Br. (in which the aril is papery and cap-like: see Henderson 1987). Shoots of *C. arcuata* may last for at least three years, producing leaves that die during summer and an inflorescence that remains green for a year until the new season's growth appears, when they gradually die and are eventually shed.

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### References

- Henderson, R.J.F. (1987). *Caesia*. In: George, A.S. (ed.) *Flora of Australia*. Vol. 45. pp. 222–223, 281–288. (Australian Government Publishing Service: Canberra.)
- Keighery, G.J. (1990). *Caesia viscida*, a new species of Anthericaceae (Liliaceae s. lat.) from south-western Australia. *Nuytsia* 7: 133–135.
- Macfarlane, T.D. & Conran, J.G. (2017). Tepal apex trichomes, specialised bud closure structures, and their systematic value in Asparagales. In: Campbell, L.M., Davis, J.I., Meerow, A.W., Naczi, R.F.C., Stevenson, D.W. & Thomas, W.W. (eds) *Diversity and phylogeny of the monocotyledons. Contributions from Monocots V: The 5th International Conference on Comparative Biology of Monocotyledons, 7–13 Jul 2013, New York*. Memoirs of the New York Botanical Garden. Vol. 118. pp. 31–42. (New York Botanical Garden: New York). DOI: <http://dx.doi.org/10.21135/893275341.012>.
- Smith, M.G. & Jones, A. (2018). *Threatened and Priority Flora list 5 December 2018*. Department of Biodiversity, Conservation and Attractions. <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants> [accessed 10 April 2019].