



## *Hibbertia fumana* (Dilleniaceae), a species presumed to be extinct rediscovered in the Sydney region, Australia

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### Abstract

*Hibbertia fumana* Sieber ex Toelken (Dilleniaceae), a species thought to be extinct, was rediscovered during routine botanical surveys in western Sydney. A revised description, including for the first time that of fruit and seed, is provided along with ecological notes, an illustration, and a photograph.

### Introduction

*Hibbertia fumana* Sieber ex Toelken (Dilleniaceae) was described by Toelken and Miller (2012) from three herbarium collections made in the Sydney area in the early 19<sup>th</sup> Century. Only the Caley collection held at the British Museum is associated with relatively precise locality information and was collected from near South Head. In the absence of any recent collections Toelken and Miller (2012) assumed the taxon was extinct.

During vegetation surveys in western Sydney in late 2016 Rodd and Stables collected species of *Hibbertia* and sent the material to the Botanical Information Service (BIS), Royal Botanic Gardens and Domain Trust (RBGDT), for formal identification. Orme (BIS) with Toelken (AD) identified some of the specimens as *H. puberula* subsp. *puberula*, but other specimens proved to be the first collections of *H. fumana* made in more than 190 years. Further surveys determined there was a population of c. 370 living plants of *H. fumana*.

The opportunity is taken here to expand on the description provided by Toelken and Miller (2012) including, for the first time, descriptions of the fruit and seed. In addition, ecological data and conservation advice on the species are provided for the first time.

This is the second significant discovery in *Hibbertia* made in the Sydney region recently and follows the discovery and description of *H. spanantha* (Toelken and Robinson 2015), a species endemic to the northern suburbs of Sydney. Further field studies, collections and research are required in the greater Sydney region to accurately ascertain the full diversity of the genus found in this region.

*Hibbertia fumana* Sieber ex Toelken, *Journal of the Adelaide Botanic Gardens* 25: 73 (2012).

**Type:** Australia, near Sydney, “*F.W.Sieber Nov. Holl. No. 147*” (holotype: MEL 31618; isotypes: K, NY – *n.v.*, S [image at JSTOR], TCD [image at JSTOR])

*Hibbertia stricta* var. *glabriuscula* Benth., *Flora Australiensis* 1: 27 (1863), partly as for *Sieber 147*.

*Pleurandra fumana* Sieber ex Benth., *Flora Australiensis* 1: 27 (1863), *nom. inval., pro syn.*

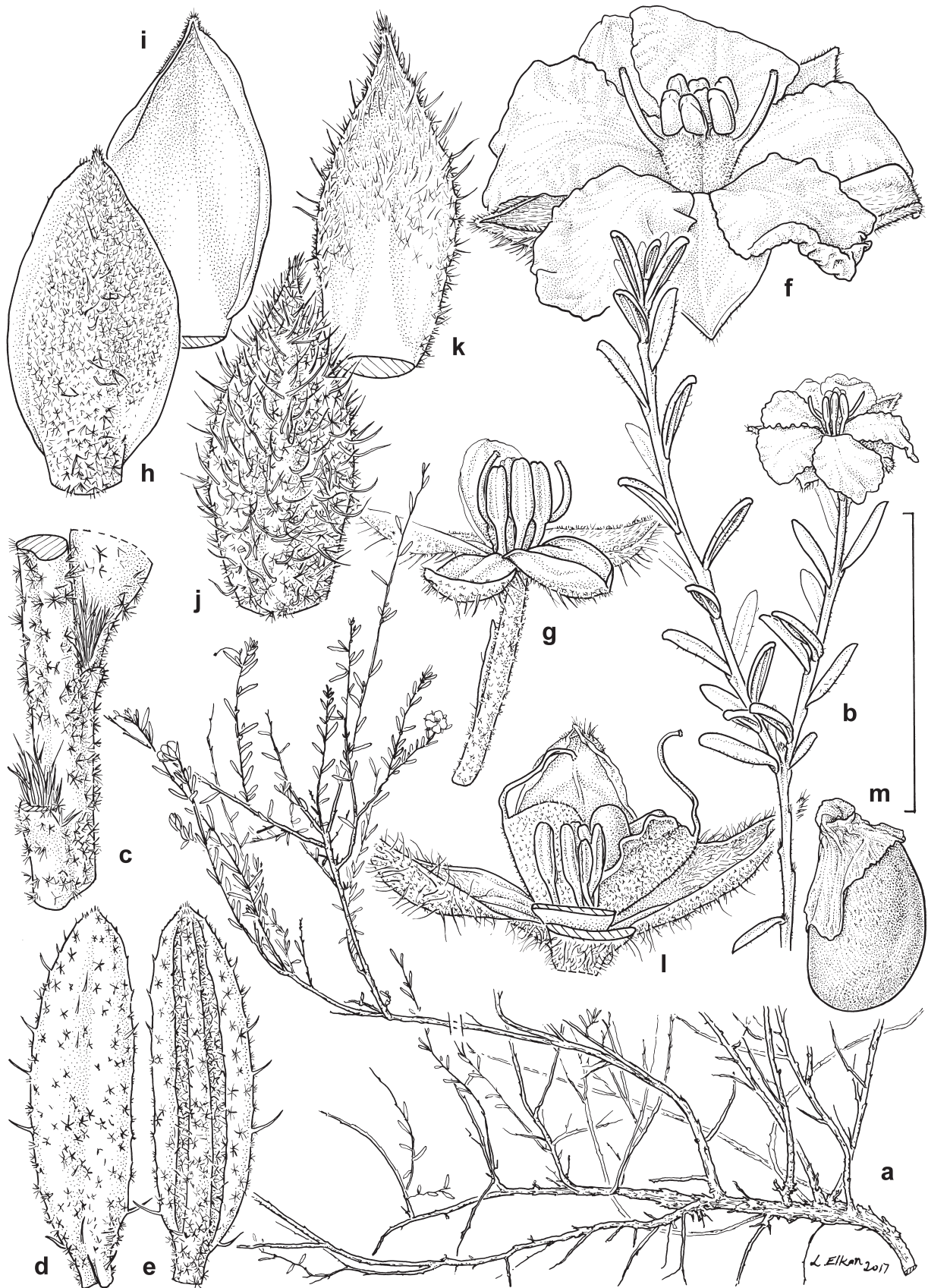
Decumbent shrublet, prostrate to weakly ascending to 20 cm high, with many branches from the base, moderately- to much-branched; branches wiry, with raised leaf bases shortly decurrent, shortly fascicled-pubescent. Vestiture persistent, consisting of more or less coarse simple hairs over fine fascicled hairs on tubercles; on branches more or less densely covered with short subequal multiangulate fascicled hairs (4–7 equal arms) and without simple hairs except for intrapetiolar tufts of hairs in leaf axils; on leaves above scattered, short antrorse fine bi- or triforked to simple hairs, sparse becoming denser onto the petiole, few simple hairs along the flanks, all wearing off soon; on leaves below dense, with short subequal multiangulate fascicled hairs (4–12 subequal arms) particularly on central vein, overtopped by few simple hairs on the flanks of the revolute margins; on outer calyx outside moderately dense, with spreading coarse antrorse simple hairs over erect-spreading multiangulate fascicled hairs (8–15 subequal arms), inside dense, with forked to simple antrorse hairs over most of surface; on inner calyx lobes outside dense with spreading multiangular fascicled hairs (2–12 subequal or unequal arms) becoming smaller towards the membranous margins, overtopped by coarse antrorse simple hairs along the central ridge, inside glabrous except for a few simple hairs towards the apex. Leaves with intrapetiolar axillary tuft of hairs to 0.7 mm long; petiole 0.2–0.45 mm long; lamina narrowly oblong, rarely linear-elliptic, (1.9–) 2.1–6.5 × 0.5–1.2 mm, obtuse, with terminal tuft of hairs on a somewhat recurved apex of the central vein, more or less abruptly constricted into petiole, above ± flat and puberulous to glabrescent, below with broadened central vein recessed below the level of revolute margins and protruding into apex, pubescent to puberulous. Flowers single, terminal, commonly on main branches; flower stalk 2–9 mm long, recurved and elongating after flowering, pubescent; bract linear to linear-triangular, 1–1.3 mm long, sometimes leaf-like to 5.5 mm long, fascicled-pubescent, on lower third to half of flower stalk. Calyx distinctly accrescent, with lobes subequally long; outer calyx lobes lanceolate, 3.5–5.7 × 1.3–1.65 mm, enlarging to 6.1 × 2.2 mm with fruit, acute to acuminate, without ridge, outside strigose-pubescent, inside finely strigose with antrorse forked hairs on much of the surface; inner calyx lobes oblong-ovate, 4.0–5.8 × 3.1–3.5 mm, usually cuspidate, outside strigose along the central vein and tomentose towards the margins, inside glabrous with few forked hairs at the apex. Petals obovate, 4–5.2 mm long, broadly bilobed. Stamens 5 or 6 (7), subequal, clustered on one side of the ovaries; filaments 0.4–0.6 mm long, basally connate; anthers broadly oblong, 1.3–1.4 mm long, ± abruptly constricted above and below. Pistils 2; ovaries obovoid but ± laterally compressed, each with 4 ovules, fascicled-tomentose, with style attached to the centrifugal apex of the ovary then after a short curve downwards straightening up on either side of the stamens with stigmas exposed above the anthers. Fruit puberulous with simple and multiangular hairs. Seeds oblong-obovoid to almost obloid, 1.6–2.0 × 1.4–1.5 mm, smooth, light brown; aril with fleshy base surmounted by one-sided membranous cup covering c. one quarter of one side of seed. **Figs 1 & 2.**

**Additional specimens examined:** NEW SOUTH WALES: CENTRAL COAST: *R.Brown* [*J.J.Bennett 4873*], “In occidental Sydney 1804” (BM); *G.Caley s.n.*, “near South Head”, viii.1802 (BM); western Sydney [precise locality withheld], *J.Rodd & M.Stables*, 19.x.2016 (NSW, 3 specimens); western Sydney [precise locality withheld], *A.E.Orme 1572*, 16.xi.2016 (AD, NSW).

**Distribution and ecology:** Currently known from one extant population of c. 370 plants in western Sydney though the species was collected at South Head, eastern Sydney, in 1802. In western Sydney the species is found in the transition zone between Castlereagh Ironbark Forest and Castlereagh Scribbly Gum woodland in open forest of *Eucalyptus sideroxylon*, *E. fibrosa*, *E. parramattensis*, *E. sclerophylla* and *Melaleuca decora* with a diverse understorey of shrubs, grasses and herbs including *H. puberula* subsp. *puberula* and *H. aspera* subsp. *aspera*.

**Conservation status:** *Hibbertia fumana* is known from one extant population with c. 370 plants scattered over c. 5 ha. The very few collections of the species suggests either that it was always rare and/or has suffered significant habitat loss early in the growth of Sydney. It has been provisionally listed as a Critically Endangered species in New South Wales, under the New South Wales Threatened Species Conservation Act (1995).

**Notes:** Toelken and Miller (2012) proposed that *Hibbertia fumana* was part of their *H. humifusa* Group, species of which have dense fascicled hairs and especially pronounced intrapetiolar tufts of hairs, more or less stalked flowers that are not aggregated into inflorescences, and decumbent to prostrate growth habit and the additional material confirms this placement. *Hibbertia fumana* is the only species of the group found in New South Wales. We can also confirm Toelken and Miller’s (2012) observations that *H. fumana* is distinguished from superficially similar species in their *H. pedunculata* Group from the Sydney area, by having stamens in a cluster on one side of the ovaries and the whole plant being fascicled-pubescent to tomentose.



**Fig. 1.** *Hibbertia fumana*. **a**, habit; **b**, branch; **c**, branch detail showing tufts of hairs in leaf axil; **d**, leaf, adaxial surface; **e**, leaf, abaxial surface; **f**, flower; **g**, flower, petals removed; **h**, inner sepal, abaxial surface; **i**, inner sepal, adaxial surface; **j**, outer sepal, abaxial surface; **k**, outer sepal, adaxial surface; **l**, flower with fruit; **m**, seed. Scale bar: **a** = 80 mm; **b** = 15 mm; **c** = 2.5 mm; **d** & **e** = 4 mm; **f** = 6 mm; **g** & **l** = 8 mm; **h**–**k** = 5 mm; **m** = 3 mm. Drawn from Orme 1572.



Fig. 2. *Hibbertia fumana*. Flower and bud, showing pedunculate flowers and fascicled hairs. Photo taken by Orme.

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