



## *Hibbertia fulva* (Dilleniaceae), a new species from the Northern Territory in the *H. banksii* species group

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**Abstract:** The new species *Hibbertia fulva* T.Hammer is recognised from specimens collected from Frances Creek mine lease, north of Pine Creek, Northern Territory. The differences between it and its closest relatives are discussed.

**Keywords:** Dilleniaceae, *Hibbertia*, new species, Northern Territory, taxonomy

### Introduction

Two specimens came to my attention while completing the *Flora of Australia* treatments for species of the *Hibbertia banksii* (R.Br. ex DC.) Benth. species group (Hammer & Thiele 2022–). These specimens were collected from two populations on Frances Creek mine lease, located north of Pine Creek, Northern Territory in 2017 (*D. van den Hoek 10* & *N. Clarke* and *D. van den Hoek 11* & *T. Orr*). In May 2023, Kym Brennan recollected the entity from a new location near Francis Creek Mine. These specimens are readily segregated from all other *Hibbertia* species based on multiple morphological characters. The new species *H. fulva* T.Hammer is described below to accommodate these specimens.

### Methods

This study was based on examination of dried specimens at AD, including those on loan from BRI, DNA and PERTH.

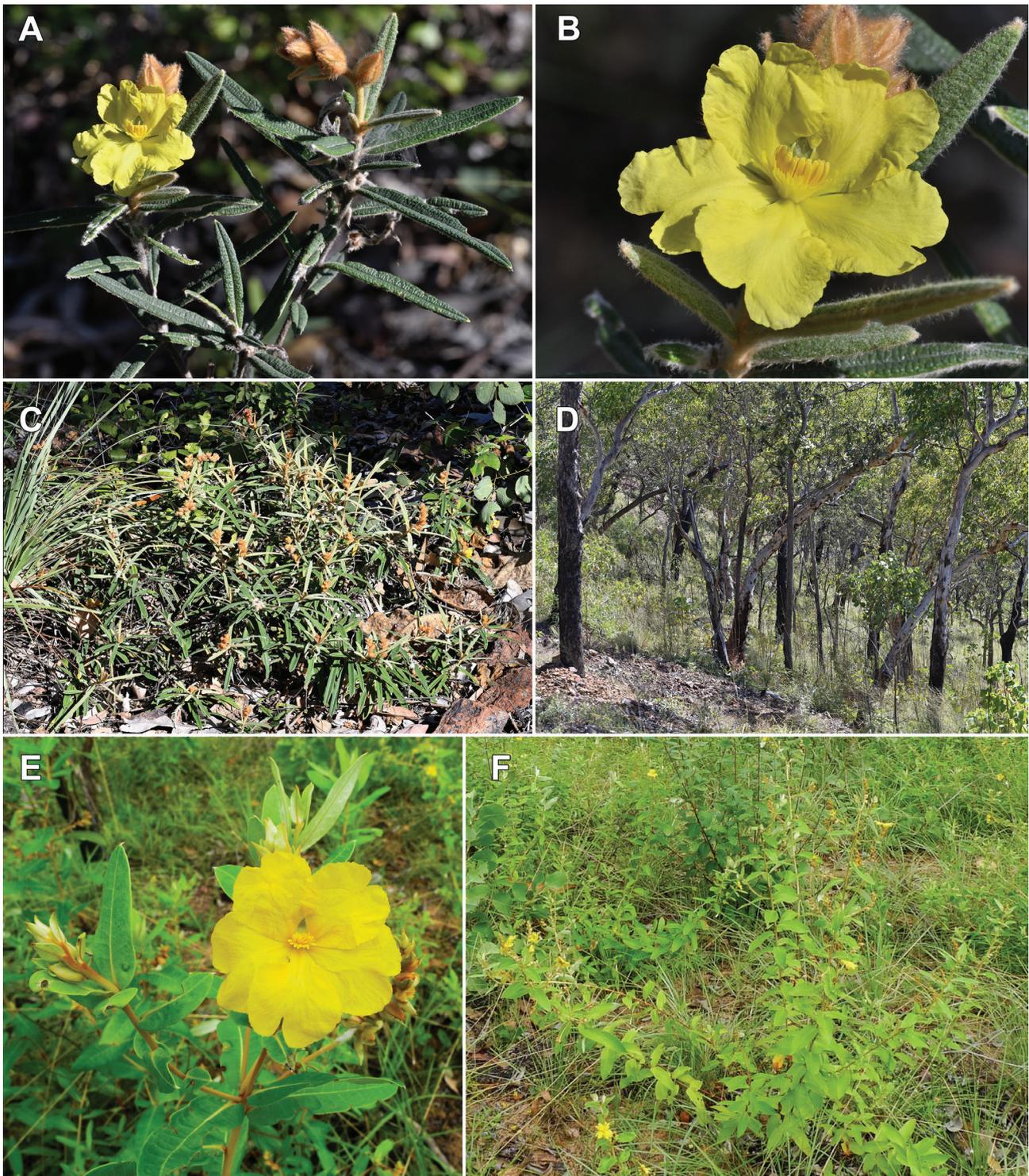
### Taxonomy

#### *Hibbertia fulva* T.Hammer, *sp. nov.*

**Holotypus:** Northern Territory, Frances Creek Iron Ore mine lease, about 31 km N of Pine Creek, 10 May 2023, *K. Brennan 13093* & *N. Clarke* (DNA D0289965). **Isotypi:** AD292801, BRI, CANB, CNS, NSW, PERTH.

Decumbent *shrubs* to 0.4 m high, multi-stemmed, apparently resprouting after disturbance. Stems ± ridged, at first very densely covered with a brownish to whitish tomentum of crisped and matted simple hairs

overtopped by ± straight and soft simple hairs that are to c. 1.5 mm long, the hairs then blackening and eventually wearing off with age but more persistent around the protruding leaf scars. *Leaves* subsessile, spreading, narrowly elliptic, 30–110 mm long, 4–13 mm wide; base ± gradually tapering; margins entire, revolute but not obscuring the abaxial surface or rarely obscuring most of the abaxial surface; adaxial surface convex with a narrow sulcus along the midrib and recessed secondary veins, the indumentum glabrescent, moderately to sparsely dense with long simple hairs when young, the hairs more persistent along the midrib; abaxial surface with a raised midrib and revolute margins, the midrib and margins with very dense, long, brownish or rusty hairs (fading white and then blackening with age), the lamina densely tomentose with matted white hairs; apex acute to obtuse, often terminated by a tuft of hairs originating from the abaxial midrib. *Inflorescences* comprising (3) 4–8-flowered cincinni, terminal on main branches; *peduncle* to c. 20 mm long, ± terete, hirsute with a brownish indumentum as for the young stems; bracts similar in shape, slightly decreasing upwards, linear to narrowly lanceolate, 6–10 mm long, 1.1–2 mm wide, very densely hirsute with brownish to whitish simple hairs. *Sepals* 5, unequal, ovate or narrowly elliptic to broadly elliptic, 8.5–13 mm long, 3–4.7 mm wide, abaxially very densely hirsute with brownish or rusty simple hairs to c. 1.5 mm long, adaxially with dense brown to pale hairs to c. 1.5 mm long, the apex acute to attenuate or cuspidate. *Petals* 5, yellow, broadly obovate, 11.3–14.2 mm long, 7.5–11 mm wide, deeply emarginate. *Stamens* 13–20, all on one side of the gynoeceum, ± obscuring the ovaries and shorter styles, unequal; filaments scarcely fused, 1–1.5 mm long; anthers narrowly oblong, 2.4–3.2 mm long, dehiscent by introrse, longitudinal slits; *staminodes* 8–15, linear or linear-oblong, 3.5–4 mm long, in a row behind the fertile stamens, ± spreading. *Carpels* 2;



**Fig. 1.** *Hibbertia fulva*: **A** flowering branches; **B** flower; **C** habit; **D** habitat, a rocky slope with eucalypt woodland. *H. brownii* subsp. *brownii*: **E** flowering branches; **F** habit. — A–D K. Brennan 13093 & N. Clarke (DNA), E, F D.E. Murfet 6818 & A. Lowrie (AD). Photos by K. Brennan (A–D) and D. Murfet (E, F).

ovaries compressed-ovoid, c. 2 mm long, very densely hirsute; styles 2.5–2.8 mm long, eccentrically attached to the ovary apex, ascending and curved away from the stamens. *Ovules* 2 per carpel. *Seeds* not seen. **Fig. 1A–D.**

**Diagnostic features.** *Hibbertia fulva* can be distinguished from other species in the genus by the

combination of the young stems, peduncle and sepals being covered with dense brownish to rusty hairs 1–2 mm long, the leaves being entire and narrowly elliptic, the inflorescences consisting of multiple flowers, the inner surface of the sepals being long-hairy throughout, and having 13–20 fertile stamens and a row of 8–15 staminodes to one side of two hairy carpels.

**Phenology.** Flowers recorded from May and June.

**Distribution and habitat.** Currently only known from near Frances Creek Mine, north of Pine Creek, Northern Territory. Reported as growing on a rocky slope below an iron-ore bearing ridge in *Corymbia dichromophloia* and *Eucalyptus tetrodonta* or *E. miniata* woodlands.

**Conservation status.** The species is not currently conservation listed but only known from populations that occur on Frances Creek mine lease. It may be restricted to the iron-bearing hills north of Pine Creek, and may be at risk from human disturbance and invasive species (e.g. gamba grass). Its conservation status should be urgently assessed.

**Etymology.** From the Latin *fulvus* (tawny, yellow-brown or orange-brown), in reference to the brownish hairs on the young stems, leaves, peduncle and calyx.

**Proposed vernacular name.** Frances Creek Guinea-flower.

**Taxonomic notes.** *Hibbertia fulva* clearly belongs to the northern Australian *H. banksii* species group due to its multiflowered inflorescences, fertile stamens situated to one side of two hairy carpels, with a row of staminodes behind the stamens (distal from the carpels). Toelken (2023: 21) determined the specimens from Frances Creek Mine to belong to a local form of *Hibbertia brownii* subsp. *brownii*, noting a few unusual characters (e.g. single terminal inflorescences, brownish hairs on the leaf midrib and revolute leaf margins). However, my subsequent detailed examination of these specimens revealed that *Hibbertia fulva* exhibits notable morphological differences to *H. brownii* (Table 1), suggesting a more distant relationship than

that proposed by Toelken (2023). Instead, *H. fulva* may be more closely related to *H. arnhemica* S.T.Reynolds and *H. ledifolia* A.Cunn. ex Benth., but can still be readily segregated from them by the multiple characters discussed below (Table 1).

*Hibbertia fulva* is distinguished from *H. brownii*, as well as the similar *H. candicans* (Hook.f.) Benth. and *H. dealbata* (R.Br. ex DC.) Benth., by having dense, long hairs covering the entire adaxial sepal surface. *Hibbertia brownii*, *H. candicans* and *H. dealbata* each have glabrous adaxial sepal surfaces or only ever have a few short, sparse hairs below the apex. Additionally, the indumentum of *H. fulva* consists of dense, long (c. 1.5 mm), simple hairs over a much denser matted tomentum on the stems, young leaves, peduncle and calyx (Fig. 1A, B). These hairs are distinctly brownish or rust-coloured when young, before fading to white and then blackening or wearing off completely. For *H. brownii*, *H. candicans* and *H. dealbata*, these hairs are short and usually appressed (Fig. 1E). The hairs on newly formed leaves are especially distinct in *H. fulva*, which are densely covered in spreading hairs to c. 1.5 mm long. Newly formed leaves in *H. brownii*, *H. candicans* and *H. dealbata* consistently have short hairs to c. 0.3 mm long. *Hibbertia fulva* can additionally be distinguished from *H. brownii* by having typically fewer flowers per inflorescence [(3) 4–8 vs. (4–) 8–12 (–18)] and longer sepals [8.5–13 vs. 6.5–7.5 (–8.3) mm] and anthers (2.4–3.2 vs. 2.1–2.3 mm).

Within the Northern Territory, *H. fulva* is most similar to *H. arnhemica*, which also has long, spreading hairs on the stems, young leaves and calyx. *Hibbertia arnhemica* is characterized by its robust nature, having ovate to broadly elliptic leaves that are (38–) 45–75 (–98) mm wide (vs. narrowly elliptic and 4–13 mm wide). It can also be differentiated from *H. fulva* by having a glabrous

**Table 1.** Comparison of characters between *Hibbertia fulva* and five similar species in the *H. banksii* species group.

	<i>H. fulva</i>	<i>H. brownii</i>	<i>H. candicans</i>	<i>H. dealbata</i>	<i>H. arnhemica</i>	<i>H. ledifolia</i>
State/Territory	NT	NT	NT, Qld	NT	NT	WA
Leaf shape	narrowly elliptic	lanceolate to lanceolate-elliptic (rarely elliptic or linear)	linear-elliptic	elliptic to broadly elliptic-obovate	ovate to broadly elliptic	linear-elliptic to linear-oblong
Leaf width (mm)	4–13	(2–) 10–25 (–32)	(2.5–) 4–12 (–31)	(10–) 16–25 (–32)	(38–) 45–75 (–98)	(2–) 5–10
Approximate max. leaf hair length (mm)	1.5	0.3	0.3	0.2	1.5	0.2
Flowers per inflorescence	(3) 4–8	(4–) 8–12 (–18)	(1–) 3–5 (6)	(6–) 8–12 (–15)	(4–) 10–16 (–19)	(3) 4–6 (–8)
Adaxial sepal indumentum	dense long hairs throughout	glabrous or with a few apical hairs	glabrous or with a few apical hairs	glabrous or with a few apical hairs	glabrous or with a few apical hairs	nearly glabrous or with row of long hairs near the central base
Sepal length (mm)	8.5–13	6.5–7.5 (–8.3)	(7.3–) 7.5–9 (–10.3)	6.3–7.5	11.5–21	8–12 (–15)
Stamen number	13–20	16–25	20–26	10–12	18–21	(28–) 30–42
Anther length (mm)	2.4–3.2	2.1–2.3	2.7–3	2.1–2.3	3.2–3.8	2.5–3.5

or near-glabrous adaxial sepal surface (vs. densely hairy) and prominent reticulate venation on the abaxial leaf surface (vs. secondary veins scarcely or not visible).

Other species from the Northern Territory in the *H. banksii* group, *H. holtzei* F.Muell., *H. lagarophylla* Toelken and *H. muelleri* Benth. (Toelken 2023), can be readily distinguished from *H. fulva*. *Hibbertia holtzei* is a prostrate or scrambling subshrub with usually broadly elliptic leaves that are sparsely to moderately puberulous on both surfaces with short hooked simple hairs (vs. the leaf indumentum dense abaxially and lacking hooked hairs). *Hibbertia lagarophylla* and *H. muelleri* can be distinguished by having narrow linear or subulate leaves, which in *H. muelleri* are revolute to the midrib. These species also lack the characteristically long, spreading, brownish hairs of the young indumentum seen in *H. fulva*.

Of all the species in the *H. banksii* group, *H. fulva* is most similar to *H. ledifolia* from the Kimberley, Western Australia. *Hibbertia ledifolia* can have long hairs on the adaxial surface of the sepals like *H. fulva* [contradicting the description of *H. ledifolia* in Toelken (2023), which states that the surface is glabrous or with a few hairs apically], but *H. fulva* has dense long hairs throughout the surface on all sepals, whereas *H. ledifolia* typically has long hairs restricted to the base of the adaxial surface (and there may also be sparse short hairs apically). The indumentum on the stems and leaves of *H. ledifolia* differs from *H. fulva* in being densely matted, short and crisped (vs. long, straight and spreading). *Hibbertia ledifolia* and *H. fulva* have similar leaf shapes (narrowly elliptic with revolute margins and the abaxial lamina visible), but the leaves of *H. ledifolia* are typically shorter (8–40 vs. 30–110 mm long). The glabrescent adaxial leaf surface of *H. ledifolia* is convex and quite smooth, almost shiny and without discernible venation apart from the midrib, while that of *H. fulva* is ± dull and bumpy from the fine grooves along the

secondary veins. *Hibbertia ledifolia* also differs by having (28–) 30–42 fertile stamens (vs. 13–20).

#### **Other specimens examined.**

NORTHERN TERRITORY. Frances Creek mine lease, near Jasmin Pit, 13 June 2017, *D. van den Hoek 10 & N. Clarke* (DNA D0275736); Frances Creek mine lease, near Ochre Hill Pit, 13 June 2017, *D. van den Hoek 11 & T. Orr* (DNA D0275737).

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### **References**

- Hammer, T.A. & Thiele, K.R. (2022–). *Hibbertia*. In: Kodala, P.G. (ed.), *Flora of Australia*. (Australian Biological Resources Study: Canberra). <https://profiles.ala.org.au/opus/foa/profile/Hibbertia> [accessed: 1 June 2023].
- Toelken, H.R. (2023). Notes on *Hibbertia* (Dilleniaceae: subgen. *Hemistemma*) — 12. The northern Australian species of the *H. banksii* group. *Swainsona* 37: 7–34.