

***Hibbertia* Andrews (Dilleniaceae, Guinea Flowers) in North Queensland, Townsville area to the tip of Cape York Peninsula**

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Abstract

Currently, thirty species of *Hibbertia* Andrews (Dilleniaceae, Guinea Flowers) are recognised in North Queensland in an area extending from Townsville to the tip of Cape York Peninsula. However, there is no key to their identification. The aim of this paper is to provide a key to recognised species/taxa, both described and undescribed, using a modified key format. Similar species are grouped together, and short descriptions provided for ease of comparison. Distinguishing features are highlighted to facilitate use by anyone interested in plants. The genus in the area is under-collected.

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Introduction

Hibbertia Andrews was named after George Hibbert (1757-1837), an English merchant and amateur botanist. They are commonly known as Guinea Flowers as their usually bright, yellow flowers were thought to resemble the appearance of an 18th Century coin known as a Golden Guinea. Although this Gondwanan genus also occurs in Madagascar, Malesia, New Guinea, New Caledonia and Fiji (Hidayati *et al.* 2012), the majority of species occur in Australia with the greatest concentration being in Western Australia. While some such as *Hibbertia scandens*, are widespread, others are relatively localised. A number of endemics on Cape York Peninsula are known only from the type locality, though this is possibly a reflection of how little is known about the genus in the area. Habitats vary from rainforest to dry semi-arid environments. Although, this genus is easy to recognise, species can be difficult to identify as a detailed suite of features need to be considered: the indumentum, the number of stamens, and

their arrangement with respect to the carpels, are usually the minimum requirements.

Horn (2007) estimated that there were about 225 species in the genus, however, subsequently a further 80 species have been described. The major publications of additional species have been Thiele (2019) – 12 species, and Toelken (2010) – 39 species. This number will doubtless continue to increase as more collections are made and species described. Thirty species are recognised in the area from Townsville to the tip of the Cape York Peninsula. Additionally, there are several specimens that currently cannot be ascribed to a recognised species or taxon because of insufficient material. Several additional species are recorded from the White Mountains area (about 80 km NE of Hughenden) but these are not included in the key, as are those species occurring only close to the Northern Territory border.

Features

Habit

Most species in the tropics are small and compact shrubs whilst some, such as *H. banksii*, can be up to 3 m tall, and a few such as *H. scandens* are vines or scramblers. Plants are often multi-stemmed at ground level, and frequently resprout after fire. Flowers are frequently borne on short shoots that commonly arise off the main branches.

Leaves

These are alternate and simple, ranging in shape from linear or linear-lanceolate to lanceolate, oblanceolate, elliptical and obovate; size varies with stage of growth. Margins of mature leaves may be entire, somewhat toothed or strongly revolute so that the underneath surface is virtually hidden. Although leaf shape is an important character for identification, the nature of the indumentum is often required to delimit taxa. This consists of hairs and scales ranging from simple (i.e. unbranched) to stellate hairs (branched and star-shaped) and peltate scales (like shortly stalked plates); density varies not only with age, but also on the various organs. It is important to note the presence or absence and the relative length of the arms on the peltate scales. Are they all about the same length or are some much longer than the other ones? For a number of species, line drawings of the hairs and scales have been included along with the descriptions. For more detailed descriptions as well as line drawings, refer to Toelken (2010). One North Queensland species, *H. longifolia*, lacks hairs or scales.

Reproductive structures

Flowers are usually solitary and often on short shoots, but in some species (e.g. *H. banksii*) they are in spikes (Reynolds 1991) or dense clusters as in *H. "Maytown Track"*. The peduncles (flower stalks) may vary in length between species. Several small bracts subtend the calyx. The calyx consists of five sepals in which the shape of the apices often varies between species, as does the nature of the indumentum and the presence or absence of hairs on the margin. The five yellow petals are typically notched at the apex except for *H. longifolia*. The number of stamens varies from 4-7 in *H. aspera* (Toelken 1998) to numerous, as in *H. melhanioides* (Toelken 2010); these may be evenly distributed around the carpels or may be predominantly on one side. Staminodes (sterile

stamens) are sometimes present as in *H. lepidota*. Most flowers in north Queensland have only 2 or 3 carpels but several species have 5 or more. The ovary is usually pubescent and the styles extend in length beyond the stamens. The persistent calyx enlarges around the expanding ovaries. The resulting fruit is capsule-like and consists of 2-5 (rarely more) loosely adhering follicles, each containing usually 2 brown seeds but the number may vary up to 6. A reddish aril covers most of these seeds, but in *H. aspera* it is white (Toelken 1998). This nutritious tissue is a valuable food source for dispersers such as ants and birds (Rice & Westoby 1981; Horn 2007).

Notes

Flowering occurs chiefly in spring and summer, but there are usually some flowers present throughout the year. Petals close at night but will fall off easily if touched, leaving the stamens and carpels surrounded by the sepals. Most species examined appear to have no nectar, so rewards for potential pollinators are the pollen and the staminodes, food sources for some visitors. However, there are reports of a weak fragrance, sweet to some but smelling like cow dung to others (Tucker & Bernhardt 2000). Pollination appears to be chiefly by bees in the native bee genera *Lasioglossum* (sweat or mining bees) and *Leioproctus* (plaster bees), and also Syrphid or hover flies, which visit to collect pollen. Larger bees can vibrate the anther so that the pollen is shed via the terminal pores as well as through the longitudinal slits (Tucker & Bernhardt 2000). Covering the pollen is an oily, yellow substance called pollenkitt which helps the pollen adhere to potential pollinators. Although birds are reported as dispersing seeds of *Hibbertia scandens*, in drier areas ants appear to be the common dispersers (Rice & Westoby 1981).

Germination of seeds is slow and initially requires the embryo to develop. When the seed is shed the embryo is a tiny 'blob' which needs to develop to form the various structures before the root/radicle can emerge. This enforced dormancy helps the plant to germinate when conditions are suitable. This may take several years. Those adapted to dry habitats seem to need several wet/dry cycles. Smoke water increases the germination rate but other factors are involved (Allan *et al.* 2004). However, many species are grown successfully from cuttings.

Key to species of *Hibbertia*, Townsville to the tip of Cape York Peninsula

This dichotomous key includes all species both described and undescribed that are confirmed as occurring in this area. It is in the form of a bracketed or parallel key, where the two alternatives of the couplet are adjacent, to each other. Both alternatives must be read before proceeding. Similar species are grouped together so that they can be easily compared; important distinguishing characters as well as, “standout characters” are highlighted. Although the known distributional range of each species is given, it is expected that these will change as more specimens are collected as *Hibbertia* is under-collected in the area. Any material that cannot be identified, should be photographed and a reproductive specimen collected and sent to the Australian Tropical Herbarium in Cairns or the Queensland Herbarium in Brisbane.

Descriptions are chiefly based on studies in the genus by Toelken (2010) and Reynolds (1991) supplemented by an examination of specimens at the Queensland Herbarium and the Australian Tropical Herbarium, as well as by field observations. All measurements are based on dried material. Leaf measurements given are those that fall within the average ranges, shorter or longer leaves may occur and are often a result of different growing conditions such as resprouting after fire. Photographs have been included for a number of species. Line drawings by Gilbert R.M. Dashorst, showing the nature of the indumentum, have been included for several species. These were first published in Toelken (2010) and are used with permission of the Board of the Botanic Gardens and the State Herbarium (Adelaide, South Australia). Please note that the density of the indumentum may vary considerably.

- 1 Erect plant; **leaves glabrous** (i.e. lacks hairs or scales); flower to 8 cm diameter, **petals lack a notch at apex**, stamens numerous

***Hibbertia longifolia* F.Muell.** (Fig. 1) Name refers to the long narrow leaves associated with the typical form. Two forms: 1. Leaves linear-lanceolate 50-160 mm long, 4-15 mm wide, length: breadth ratio about 10:1; 2. Leaves lanceolate to broadly-lanceolate 30-80 mm long, 15-35 mm wide, length: breadth ratio about 2.5:1.



Figure 1. *Hibbertia longifolia*: left – flower, Mt Misery; right – habit, Herberton Range. Photos: Roger Fryer.

- 1* Habit various; leaves with hairs and/or scales present; flower size variable, but **petals notched at apex** 2
- 2 Leaves linear to linear-lanceolate, to 2.5-3 mm wide, rarely more, and then less than 80 mm long 3
- 2* Leaves various; if linear or linear-lanceolate and less than 4 mm wide then longer than 80 mm 7

3 Mature leaves with simple, erect hairs only

***Hibbertia concinna* F.M.Bailey.** (Fig. 2) Named for the neat appearance of the plant, the leaves are **compactly arranged at the end of small branches**. Leaves linear to **10-12 mm long**, about 1-1.5 mm wide, margins recurved, hairs spreading, 0.5-0.75 mm long. Flowers sessile, 1-1.5 cm diameter, petals pale yellow, stamens about **15** and filaments irregularly united at the base **Styles red/brown in colour**. This small shrub occurs on the Atherton Tableland, particularly in the Herberton area.



Figure 2. *Hibbertia concinna*, Mt Emerald area, west of Tolga.
Photo: Andrew Ford.

***Hibbertia millari* F.M.Bailey.** This small shrub was named after T. Barclay Millar, a miner and naturalist. Young growth bears white, silky hairs. Leaves linear to linear-oblong, **50-80 mm long** and 2-3 mm wide, upper surface glabrous but lower surface is silvery white due to silky hairs. Flowers sessile, usually more than 1 per inflorescence, about 2 cm diameter, stamens about **20** grouped on one side of carpels; some staminodes may be present. Occurs in the Musgrave to Coen area.

***Hibbertia synandra* F.Muell.** (Fig. 3) The name refers to the stamens being close together. An erect shrub to 1.5 m tall, with leaves linear to linear-lanceolate, **8-15 mm long** and 1-3 mm wide but usually less than 2 mm. Mature leaves with simple hairs only, shiny above and greyish-white below, margins recurved. Flowers sessile-subsessile, about 2 cm diameter, **calyx rusty brown in colour when fresh**, stamens **10-20** on one side of the carpels, no staminodes, **the 2 styles red/brown in colour**. This species, has been recorded from near Charters Towers, as well as in the Paluma area and north to Cooktown. This group are being reviewed by Toelken (personal communication)



Figure 3. *Hibbertia synandra*, Mt Zero, west of Paluma.
Photo: Rigel Jensen.

3* Mature leaves with either a mixture of stellate and simple hairs or peltate scales

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4

4 Leaves densely arranged along the stem; flowers clustered at the end of shoots

Hibbertia "Maytown Track". (Fig.4) Leaves linear, 15-25 mm long, strongly recurved, apex pointed but not pungent, upper surface glabrous, **hairs on lower surface densely cobwebby**. Flowers densely clustered towards the ends of shoots, virtually sessile, stamens on one side. Locally common in the Laura-Maytown area.



Figure 4. *Hibbertia "Maytown Track"*, Laura area.
Photo: Bruce Wannan.

- 4* Leaves not densely arranged along the stem; flowers not clustered at end of shoots 5
 5 Carpels 5; leaves linear, apex acute

Hibbertia "Taravale". (Fig. 5) This undescribed species is endemic to the western side of Mt. Zero and the Ben Lomond area west of Townsville. A bushy spreading shrub with linear leaves 10-13 mm long and up to 1 mm wide, margins recurved, apex often recurved and mildly pungent, stellate hairs scattered rather than dense on upper surface. Flowers on peduncles 7-11 mm long; stamens about 15, carpels 5.



Figure 5. *Hibbertia "Taravale"*, Taravale, west of Paluma. Photos: Russell Cumming.

- 5* Carpels 2; leaves lacking an acute apex 6

- 6 Stamens 6-10 rarely more; leaves more or less of a similar length

***Hibbertia cistoidea* (Hook.) C.T.White.** (Fig. 6) The name refers to its resemblance to a species of *Cistus*. This species was formerly part of the *H. stricta* complex. Leaves are elliptical with revolute margins, often densely covered on both sides with stellate hairs usually with one arm longer than the others, often easiest seen on the sepals. Flowers 1.2-1.6 cm diameter, borne on short shoots, peduncles to 3 mm long, stamens 6-10(-12), rarely more in northern populations, carpels 2. Widespread extending west to Charters Towers and the White Mountains area, and up to the Windsor Tableland.



Figure 6. *Hibbertia cistoidea*, Mt Zero, west of Paluma. Photos: Rigel Jensen.

- 6* Stamens 10 or more may be up to about 70; leaves often variable in length even on the one branch

***Hibbertia lepidota* R.Br. ex DC. (Scaly Guinea Flower).** (Fig. 7) The name refers to the dense covering of **broad-ribbed peltate scales** particularly prominent on the leaves. Leaves linear to linear-elliptic, 15-25(-40) mm long, 1-2 (-4) mm wide, sometimes slightly curved; margins more or less incurved or flat. Flowers about 1 cm diameter, stamens **15-24**, staminodes present. This widespread species is highly variable, appearance of fast growing branches differs from slow or old branches. It has been recorded from the Mount Surprise area, north and west and extending into WA.



Figure 7. *Hibbertia lepidota*: left – Split Rock; right – scales on upper leaf surface. Photo: Roger Fryer. Line drawing: Gilbert Dashorst.

***Hibbertia mulligana* S.T. Reynolds.** (Fig. 8) Specimens with very narrow leaves may come out here, for more detail refer to **couplet 14**. Stamens >50.



Figure 8. *Hibbertia mulligana*: stellate hairs on lower leaf surface.

Line drawing: Gilbert Dashorst.

***Hibbertia stelligera* (C.T.White) Toelken.** (Fig. 9) Leaves with a mixture of **peltate scales and stellate hairs**, linear to linear-oblongate, highly variable in length; margins recurved. Flowers 1.5-2 cm diameter, peduncle usually <10 mm long, stamens **20-32**; anthers <2 mm long. Found from the Townsville area to the Herberton area.

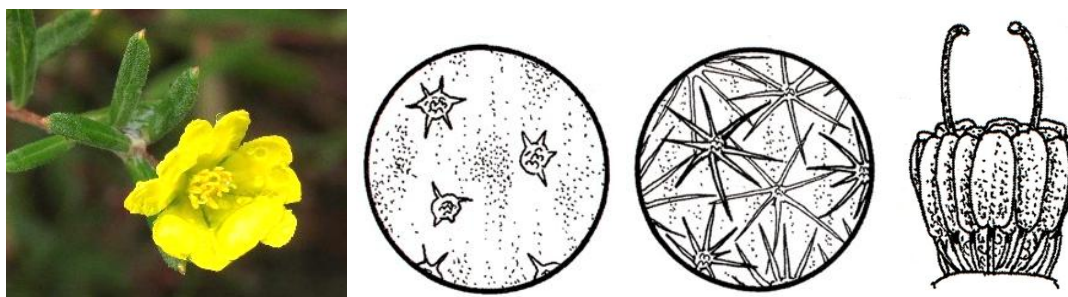


Figure 9. *Hibbertia stelligera*: left – flower, Mt Zero, west of Paluma; centre left – stellate hairs on upper leaf surface; centre right – stellate hairs on lower leaf surface; right – reproductive structures. Photo: Rigel Jensen. Line drawings: Gilbert Dashorst.

***Hibbertia stirlingii* C.T.White.** (Fig. 10) Named after J. Stirling who was the original collector. Leaves variable in length, linear, margins recurved, **scales chiefly peltate**. Flowers 1.5-2 cm diameter, peduncle usually >15 mm long, stamens **10-12**; anthers **2.5+ mm**. Occurs in the Herberton – Watsonville area.

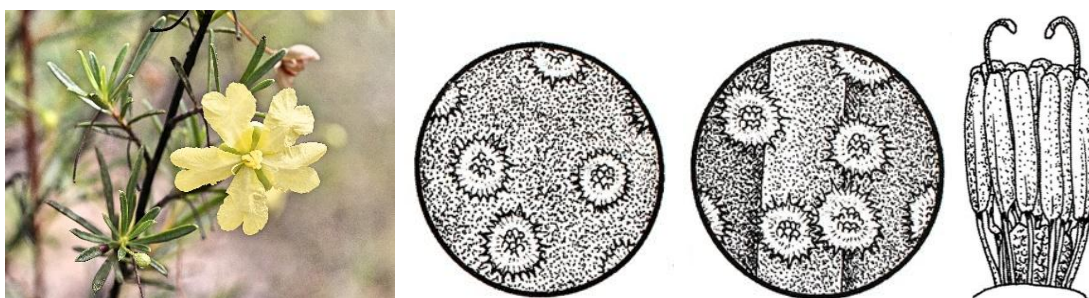


Figure 10. *Hibbertia stirlingii*: left – flower, Irvinebank; centre left – scales on upper leaf surface; centre right – scales on lower leaf surface; right – reproductive structures. Photo: Roger Fryer. Line drawings: Gilbert Dashorst.

7 Plants scrambling and or climbing

***Hibbertia scandens* (Willd.) Dryand. (Climbing Guinea Flower).** (Fig. 11) The name refers to its scrambling or climbing habit. This species was once known as *H. volubilis* Andrews. This scrambler is common along the east coast from Cape York to eastern Victoria, particularly on the edge of rainforest communities. Leaves 40-110 mm long, 10-35 mm wide, hairs simple and adpressed, sparse above, variable below, margins of mature leaves entire *cf. H. dentata* (essentially a southern species) where margins of mature leaves are usually toothed. However, juveniles are often toothed on the margin. Flower 5-7 cm diameter *cf. H. dentata* 3-4 cm diameter, stamens numerous surrounding the 3-8 carpels. Plant has an obnoxious odour; some consider it resembles crushed almonds, others dung! Fruit reported to be eaten by birds.



Figure 11. *Hibbertia scandens*: left – flower, NW of Mt Molloy; right – fruit, Davies Creek. Photos: left – Rigel Jensen; right – Roger Fryer.

7* Plants usually erect but sometimes procumbent 8

8 Flowers in spikes; mature plants more than 2 m tall

***Hibbertia banksii* (R.Br. ex DC.) Benth. (Rusty Guinea Flower).** (Fig. 12) Named after Sir Joseph Banks. Leaves 35-115 x 7-30 mm, sometimes much smaller; small teeth on some leaves only; upper surface glabrous, undersurface of leaves **densely covered with rusty coloured hairs, midrib and veins usually darker.** Inflorescence with 3-8 flowers covered in rusty hairs, flowers **1-2.5 cm diameter**, stamens numerous on one side of the 2 carpels. Plants about 3 m tall, recorded north from the Daintree area as well as in PNG.



Figure 12. *Hibbertia banksii*: left – inflorescence, Cooktown; right – flower, Cooktown. Photos: left – Rigel Jensen; right – Roger Fryer.

***Hibbertia candicans* (Hook.f.) Benth.** (Fig. 13) The name refers to the whitish underneath surface of the leaf. This species occurs from about the Musgrave area of Cape York north to the tip, as well as in NT. Leaves are chiefly narrow-elliptic, 50-100 mm long, 2-10 mm wide, margins incurved or with a folded appearance, apex acute to mucronate, simple hairs result in a **whitish (felty/cobwebby) appearance to the lower surface**, midrib often reddish, laterals often visible. Inflorescence axillary or terminal with 1-3, rarely more, flowers borne on long peduncles 12-25 mm long; flowers to **4 cm diameter**, stamens on one side of the carpels.



Figure 13. *Hibbertia candicans*, north of Coen.
Photo: Rigel Jensen.

***Hibbertia laurana* S.T.Reynolds.** (Fig. 14) This species was named for the type locality near the Laura River. Leaves 40-95 x 20-40 mm, **undersurface of leaves with pale hairs except for the rusty-brown hairs on veins, lateral veins often showing on upper surface, but this depends on width of leaf.** Inflorescence with 3-5 flowers, buds 1.5-2 cm long, peduncles usually less than 10 mm long, flowers to **5 cm diameter**, calyx densely rusty, stamens numerous on one side of the 2 carpels. Plants 2-4 m tall; Laura-Cooktown area.



Figure 14. *Hibbertia laurana*, Split Rock.
Photo: Roger Fryer.

8* Inflorescence various but not in spikes; mature plants usually less than 2 m tall, sometimes procumbent 9

- 9 Stamens <10 filaments partially fused; leaves oblong-lanceolate to obovate 5-13 mm long, 2.5-5 mm wide

***Hibbertia aspera* DC. (Rough Guinea Flower).** (Fig. 15) The name refers to the rough or uneven leaf surface. Hairs on upper leaf surface both stellate and simple and also erect, densely stellate below. Flowers to 1 cm diameter, abruptly constricted onto the peduncle, stamens (2-)**4-7**(-9) arranged on one side of the 2 carpels, **filaments fused for about half their length**. This species forms a low spreading shrub chiefly found between Townsville and Cairns.



Figure 15. *Hibbertia aspera*.
Photo: Wikimedia Commons.

- 9* Stamens >10, filaments not fused; leaves variable in shape longer than 10 mm, habitat various 10

- 10 Leaves with 6-10 lateral veins visible on upper surface; **simple, hooked hairs on margins of young leaves**

***Hibbertia reticulata* Toelken.** Name refers to the obvious reticulate venation on the upper surface of the leaves. Leaves oblanceolate, 15-70 x 10-23 mm, lower surface with very dense stellate hairs so that it appears **felty**. Flowers usually more than 2 cm diameter on peduncles up to 20 mm long, petals deep yellow in colour, stamens 32-48, unequal in length. This species that is often more than 2 m tall, occurs chiefly in the Iron Range area.

- 10* Leaves without lateral veins being obvious on upper surface; simple hooked hairs not present on the margin of the leaf 11

- 11 On each plant at least some leaf margins toothed, particularly juveniles 12

- 11* All leaf margins entire 14

- 12 Stamens 20-26

***Hibbertia bicarpellata* Toelken.** (Fig. 16) This species is part of the *H. melhanioides* group; it can be distinguished from the latter by the **2 versus 3 carpels**, hence the name. It occurs from the Atherton Tableland north to the Cooktown area. A shrub to about 1.5 m tall, juvenile leaves are often toothed. Leaves usually elliptical, 20-60 x 8-22 mm, stellate hairs are dense on the lower surface where there are smaller ones overtopped by larger ones, hairs with long arms common, sparser on upper surface. Flowers about 2 cm diameter, on peduncles 4-10 mm long, hairs and scales on calyx, stamens 20-26, carpels 2.



Figure 16. *Hibbertia bicarpellata*: left – near Koombooloomba, S of Ravenshoe; centre – stellate hairs on upper leaf surface; right – stellate hairs on lower leaf surface. Photo: Rigel Jensen. Line drawings: Gilbert Dashorst.

***Hibbertia caudice* Toelken.** (Fig. 17) The name refers to the thick rootstock, a feature which Toelken (2010) notes it has in common with *H. cistifolia*, a species with which it has often been confused. Toelken (2010) does not consider this latter species to occur in Queensland. This multi-stemmed plant may be erect or prostrate. Leaves oblanceolate to elliptic, size highly variable but usual range is 20-60 x 6-10 mm. Juvenile leaves are often toothed. Both leaf surfaces are covered with stellate hairs that have both **long and short arms**, not as dense on upper surface so that the laterals are easier to see. Flowers 1-3 on peduncles usually more than 10 mm long; flowers up to 2 cm diameter. **Scales of different sizes are prominent on the bracts and sepals**; stamens 24-26, surrounding the ovary; anthers about 2-2.5 mm long. In Qld this species occurs north from about Coen as well as in the NT. **“A wiry looking plant”**. NB. Plants with only entire leaves will key to couplets 15 and 15*. NB. *H. cistifolia* in NT has a flattened ridge along the young stem.



Figure 17. *Hibbertia caudice*, north of Coen. Photos: Rigel Jensen.

12* Stamens more than 30 13

13 Stamens 30-36 (-40) unequal in length; leaf margins usually entire

Hibbertia velutina* R.Br. ex Benth.** (Fig. 18) The name refers to the velvety appearance on lower surface due to hairs. There are herbarium specimens that have been identified as this species from Gladstone to Cairns. However, Toelken (2010) considers it to only occur on coastal plains in Central Queensland and that the other specimens need to be reassessed. It has a spreading habit, leaves very variable in size on the one branch, (20-)35-60 x 10-20 mm, apex acute, stellate hairs with **long spreading arms** on lower surface. Stamens 30-36(-40) **unequal in length** surrounding the 2 carpels. Refer to **couplet 15 for a plant provisionally listed as *H. aff. velutina*.



Figure 18. *Hibbertia velutina*, stellate hairs on lower leaf surface. Line drawing: Gilbert Dashorst.

13* Stamens 37 to more than 50, some leaves with teeth or sinuate

***Hibbertia malacophylla* Toelken.** (Fig. 19) Names refers to the soft silky appearance of the hairs on the lower surface. Another Central Queensland species that is similar to *H. velutina*, it grows on Many Peaks Range, S of Gladstone, and prefers a different habitat to the former species; as well there is a record from the Wallaman Falls area west of Ingham. Leaves 20-35 x 8-15 mm, apex obtuse, base tapers into petiole, both surfaces covered with stellate hairs, with long arms resulting in a silky appearance, particularly on the lower surface. Stamens **50-55** as well as staminodes, surround the **2 carpels**.

NB. A specimen collected near the base of the Bluewater Range off the Forestry Rd, north of Townsville may belong to this species but despite efforts it has not been recollected.



Figure 19. *Hibbertia malacophylla*, stellate hairs on lower leaf surface. Line drawing: Gilbert Dashorst.

Hibbertia melhanioides* F. Muell.** (Fig. 20) Named because the plant is “*Melhania* like”. According to Toelken (2010), this species occurs on ***coastal ranges in an area from north of Ingham to Gordonvale. Leaves 25-50 x 10-20 mm, juveniles may be up to 90 mm long, margins toothed to irregular. Leaf base tapers into petiole, **midrib scarcely grooved on the upper surface**. Peduncle 10-35 mm long. It is distinguished from *H. velutina* and *H. malacophylla* by the stellate hairs only having relatively short arms or a mixture. Stamens **>50 + staminodes** surrounding the **3 carpels**.



Figure 20. *Hibbertia melhanioides*: left – flower, Pyramid, Gordonvale; centre – stellate hairs on upper leaf surface; right – stellate hairs on lower leaf surface. Photo: Roger Fryer. Line drawings: Gilbert Dashorst.

***Hibbertia nemorosa* Toelken.** (Fig. 21) The name means “pertaining to the woods, a reference to the habitat. Separated from *H. melhanioides*, it was initially described as *H. heterotricha* by Toelken (2010) but he later found the name to be illegitimate. Principally found in the Townsville – Paluma region but also on Hinchinbrook Island and Wallaman Falls area in sclerophyll forest. Leaves 45-60 x 12-20 mm, juveniles toothed, leaf **base often abruptly constricted into the petiole, midrib and laterals more or less grooved on upper surface**, thus the venation is visible as it is not particularly obscured by hairs. Peduncle usually less than 15 mm long. Stamens **37-45 surrounding the 2-3 carpels + staminodes**.



Figure 21. *Hibbertia nemorosa*; left – Hinchinbrook Is.; right – stellate hairs on lower leaf surface. Photo: Rigen Jensen. Line illustration: Gilbert Dashorst.

14 Stamens 50-80

***Hibbertia cymosa* S.T.Reynolds.** The name refers to the cymose inflorescence. It is known only from the type locality at Jowalbinna (Laura area). Leaves are obovate to obovate-elliptical, **40-60 mm long, 12-18 mm wide** with entire margins densely stellate hairy below, but hairs sparse on upper surface. Inflorescence 2-3 flowered, flowers 1.2-1.6 cm diameter, stamens 52-80 surrounding the carpels, **filaments united at base**.

***Hibbertia eciliata* Toelken.** (Fig. 22) This shrub lacks ‘cilia’ on the stellate hairs. It occurs north of the Hope Vale area. Leaves elliptic to elliptic-oblongate, **8-18 x 3.5-6 mm**, lower surface densely scaly with two different sizes of scales overtopping each other. Flowers to 2 cm diameter, stamens 50-54, filaments free or slightly fused together at the base, some staminodes usually present. The presence of the “**small usually oblanceolate leaves**” makes this species easily recognisable.



Figure 22. *Hibbertia eciliata*, Starcke Rd, Cooktown. Photo: Roger Fryer.

***Hibbertia mulligana* S.T.Reynolds.** (Fig. 23) Found in the Mt Mulligan area hence the specific name. Leaves are narrowly elliptic, to elliptic-obovate, (18-)32-45 x (1.5-)2.5-5.5 mm, margins recurved, both surfaces covered with stellate hairs but particularly dense on lower surface. Flowers to 1.5 cm diameter born on a densely hairy peduncle 1.2-3 cm long, stamens 70-74 surround the carpels, filaments free.



Figure 23. *Hibbertia mulligana*, stellate hairs on lowr leaf surface.
Line drawing: Gilbert Dashorst.

- 14* Stamens less than 50 15
 15 Leaves with peltate scales, rather than with stellate hairs

***Hibbertia echiifolia* R.Br. ex Benth.** (Fig. 24) The name is derived from the hair tufts that occur in the axils of the upper leaves (often hard to see). Upper ends of leafy branches are **prominently angled** (decurent from point of attachment). Leaves in subspecies *echiifolia* are usually in the range of 13-55 x 5-8 mm, and densely scaly. Peduncles about 10 mm long, angled, flowers about 3 cm diameter, **hairs on the margins of the sepals dark rusty colour**, petals prominently notched, stamens 29-45 unequal in size, in groups around the ovary. It occurs north from Laura as well as in NT and in WA.



Figure 24. *Hibbertia echiifolia*: left – Laura area; right – Musgrave area.
Photos: left – Stuart Worboys; right – Bruce Wannan.

***Hibbertia pholidota* S.T.Reynolds.** (Fig. 25) The name refers to the scales on the plant. This plant may be trailing or somewhat erect. Young branches angular. Stems, leaves, petioles and peduncles all covered with **large shiny peltate scales that lack arms**, hence the specific epithet. Leaves are oblong to oblong-elliptical, (10-)27-57 x (3-)6-12 mm, margins are usually flat. Upper surface sparsely scaly, but lower densely scaly. Flowers to 17 mm diameter, solitary, peduncle about 20 mm long, stamens 30-39 surrounding the 2 carpels. Found in the Cardwell area particularly on Hinchinbrook Is., and Bishop's Peak. Easily recognized by the scales "**on the upper surface, appearing like buttons since they lack arms**", sometimes found chiefly along the edge, sometimes scattered.



Figure 25. *Hibbertia pholidota*: left – leaves and flower (pressed specimen, Hinchinbrook); right – irregular rows of irregular scales on upper surface of leaf.

Collection: Jeannette Kemp. Line drawing: Gilbert Dashorst.

***Hibbertia caudice* Toelken.** Specimens with small leaves with entire margins and mainly peltate scales, will key out here, refer to **couplet 12** for the short description of the species.

15* Leaves with stellate hairs

***Hibbertia araneolifera* Toelken.** The name refers to the hairs on the lower surface that have short arms and thus give the appearance of **many tiny spiders**, similar scales appear on the upper surface but they are not as dense. This shrub growing to 60 cm tall, has elliptic-oblancoate leaves, 15-40 mm long, 5-17 mm wide, with occasional teeth on young leaves. Leaf **apex obtuse or truncate with a blunt callus point**. Flowers to 20 mm diameter, stamens 40-45 somewhat unequal in size surrounding the **3 carpels**. Occurs from Daintree north to the Starcke.

***Hibbertia caudice* Toelken.** Specimens with small leaves with entire margins and mainly stellate hairs, will key out here, refer to **couplet 12** for the short description of the species.

***Hibbertia rufociliata* Toelken.** The name refers to the usually **rusty-coloured arms or cilia** on the hairs on bracts and calyx as well as on the lower leaf surface. Shrub usually less than 1 m tall, leaves are oblong-lanceolate, 25-50(-70) x (1-)3-7.5(-12) mm, hairs stellate, dense. Inflorescence in the form of **short axillary clusters**. Flowers 1-2 cm diameter, petals pale yellow, stamens 36-44 surrounding the **2 carpels**. Endemic to the area north of Laura on eastern coast of Cape York Peninsula.

Hibbertia* aff. *velutina (refer also to **couplet 13**). There is a specimen in the Australian Tropical Herbarium (CNS 145209.1) collected in the Laura area which currently best fits this species. Juvenile leaves not seen, thus it is unknown if any are toothed. Leaves are narrowly lanceolate to oblanceolate, 30-40 mm long, 5-6 mm wide, apex obtuse, midrib on upper surface depressed, on lower surface lateral veins visible and more or less at right angles to the midrib. Hairs stellate, rosette-like with long arms one usually longer than the others, denser on lower surface. Flowers and fruits not seen.

Note *Hibbertia cistifolia* R.Br. ex DC. The presence of this species on Cape York Peninsula needs to be reassessed as according to Toelken (2012) this multi-stemmed shrub is not found there. It does occur in the Northern Territory. It is superficially similar to *H. caudice* (couplet 12).

Excluded species

The following species have not been included in this paper, although recorded in the Atlas of Living Australia (ALA) (2019), as being present but since most specimens are on loan their presence has not been able to be verified or reassessed. These species have been excluded because most of the records do not occur in Queensland.

Hibbertia brownii Benth. A species from NT with two records from Qld, Laura area (NSW 412395) and Bamaga (CANB 189426.1).

Hibbertia cistiflora N.A.Wakef. "Rock Rose Guinea Flower", although this is essentially a NSW species there is a record for the NT at Nourlangie (NSW 224548). Two specimens from CANB that have been checked have been identified as *H. caudice* (CANB 755521.1) and *H. araneolifera* (CANB 755530.1) respectively.

Hibbertia dealbata (R.Br. ex DC.) Benth. Essentially an NT taxon but some records from near the tip of Cape York Peninsula (CANB 192269.1; CANB 197920.1; CANB 221541.1; CANB 193467.1, and CANB 313651.1). However, no collections have been recorded since 1978.

Hibbertia glaberrima F.Muell. "Central Australia Guinea Flower" – three specimens from Mt Mulligan (QRS 27655.1; QRS 276544.1 and JCT-S1394.1) have now been assigned to *H. mulligana*.

Hibbertia oenotheroides – a name of uncertain application according to CHAH (APNI)

Hibbertia ovata Steud. There is one record from the Atherton Tablelands of this WA species. It was collected in 1970 (QRS 503401.1).

Hibbertia salicifolia (DC.) F.Muell. Although outside the scope of this paper there is a record of this species from NNW of Cloncurry collected by F.M. Bailey. No other specimens north of Shoalwater Bay (NSW 12140) have been recorded.

Hibbertia scabra R.Br. ex DC. Another NT species with one Qld record, collected from near Herberton in 1899 (NSW 224840).

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References

- ALA [Atlas of Living Australia]. <https://www.ala.org.au/>, accessed 22 June 2019.
- Allan SM, Adkins SW, Preston CA, Bellairs SM. 2004. Improved germination of the Australian natives: *Hibbertia commutata*, *Hibbertia amplexicaulis* (Dilleniaceae), *Chameascilla corymbosa* (Liliaceae) and *Leucopogon nutans* (Epacridaceae). *Australian Journal of Botany* 52: 345-351.
- Hidayati SN, Walck JL, Merritt DJ, Turner SR, Turner DW, Dixon KW. 2012. Sympatric species of *Hibbertia* (Dilleniaceae) vary in dormancy break and germination requirements: implications for classifying morphophysiological dormancy in Mediterranean biomes. *Annals of Botany* 109: 1111-1123.
- Horn JW. 2007. Dilleniaceae. In *Flowering Plants: Eudicots. The Families and Genera of Vascular Plants*, ed. K Kubitski, vol. 9: 132-154. Springer: Berlin, Heidelberg.
- Reynolds ST. 1991. New species of *Hibbertia* Andrews (Dilleniaceae) from Australia. *Austrobaileya* 3: 529-539.
- Rice B, Westoby M. 1981. Myrmecochory in sclerophyll vegetation of the West Head, New South Wales. *Australian Journal of Ecology* 6: 291-298.
- Thiele KR. 2019. A revision of the *Hibbertia commutata* (Dilleniaceae) species group. *Australian Systematic Botany* 32: 71-109.
- Toelken HR. 1998. Notes on *Hibbertia* (Dilleniaceae) 2. The *H. aspera* – *empetrifolia* complex. *Journal Adelaide Botanic Gardens* 18: 107-160.
- Toelken HR. 2010. Notes on *Hibbertia* (Dilleniaceae) 5. *Journal Adelaide Botanic Gardens* 23: 1-117.
- Toelken HR. 2012. Notes on *Hibbertia* (Dilleniaceae) 7. *Journal Adelaide Botanic Gardens* 25: 55-70.
- Tucker SC, Bernhardt P. 2000. Floral Ontogeny, Pattern Formation, and Evolution in *Hibbertia* and *Adrastaea* (Dilleniaceae). *American Journal of Botany* 87: 1915-1936.