

# *Aglaia monticola* W.E.Cooper & P.I.Forst. (Meliaceae), a new species for Queensland's Wet Tropics

W.E. Cooper & Paul I. Forster

## Summary

Cooper, W.E. & Forster, P.I. (2021). *Aglaia monticola* W.E.Cooper & P.I.Forst. (Meliaceae), a new species for Queensland's Wet Tropics. *Austrobaileya* **11**: 80–86. *Aglaia monticola* W.E.Cooper & P.I.Forst. is described, illustrated and compared with *A. brassii* Merr. & L.M.Perry from New Guinea and the Solomon Islands. The new species is restricted to montane rainforests in the northern Wet Tropics bioregion, between Mt Pieter Botte and Mount Lewis. Notes on habitat are provided, as well as a key to the Australian species from the genus.

Key Words: Meliaceae; Aglaia; *Aglaia monticola*; Australia flora; Queensland flora; new species; taxonomy; rainforest; Wet Tropics bioregion

W.E. Cooper, Australian Tropical Herbarium, James Cook University, Cairns Campus, McGregor Road, Smithfield, Queensland 4878, Australia. Email: wendy@williamtcooper.com.au; Paul I. Forster, Queensland Herbarium, Department of Environment and Science, Brisbane Botanic Gardens, Mt Coot-tha Road, Toowong, Queensland 4066, Australia. Email: paul.forster@des.qld.gov.au

## Introduction

*Aglaia* Lour. (Meliaceae) comprises approximately 120 species in Indomalaysia, Australia and the Western Pacific with 12 occurring in Australia and four or five considered endemic (Pannell 2013); however, *A. tomentosa* Teijsm. & Binn. was erroneously included in that conclusion (pers. comm. C. Pannell 2021). Five species are now recognised as endemic to Australia: *A. australiensis* Pannell, *A. cooperae* Pannell, *A. ferruginea* C.T.White & W.D.Francis, *A. meridionalis* Pannell and *A. monticola* W.E.Cooper & P.I.Forst. sp.nov. The Australian species all occur in rainforest communities in the Northern Territory (two species), Queensland (12 species) and Western Australia (two species). The greatest concentration of the Australian species is in north Queensland with centres of species diversity in the Wet Tropics and Cape York Peninsula Bioregions. The southern limit for *Aglaia* in Australia is at Mary River Heads between Hervey Bay and Maryborough (Forster *et al.* 1991).

Pannell (1992: 249) recorded *Aglaia brassii* Merr. & L.M.Perry from New Guinea, the Solomon Islands, Silver Plains and the Mt Lewis Range in Queensland, Australia. The type collection of *A. brassii* (*Brass 3189*, lecto: A 00044617 *i.d.v.*<sup>1</sup>, *fide* Pannell 1992: 249; isolecto: BISH 1003332 *i.d.v.*, BM 0007999556 *i.d.v.*, BM 0007999557 *i.d.v.*, BRI [AQ23063], L 401400 *i.d.v.*) is from Meringe, Ysabel island in the Solomon Islands. We consider *Aglaia brassii* to be a lowland species of the Solomon Islands and New Guinea and not to occur in Australia. The Australian material from the Mt Lewis Range is described here as *A. monticola* W.E.Cooper & P.I.Forst. with this species being restricted to the upland rainforests of Queensland's Wet Tropics Bioregion north of the Black Mountain Corridor.

*Aglaia monticola* appears to have first been collected by Richard Schodde in 1964 from the Mt Lewis area. It has been commonly collected from rainforest bordering the Mt Lewis forestry road since then and has a narrow range from a northern limit at Mt Pieter Botte, south to near Mt Lewis.

<sup>1</sup>*i.d.v.* = *imago digitalis visa*

## Materials and methods

The study is based upon the examination of herbarium material from BRI and CNS, as well as field observations. All specimens cited have been seen by the authors apart from those indicated *i.d.v.* (*imago digitalis visa*), that have been examined on JSTOR Global Plants.

Measurements of the floral parts and fruits are based on material preserved in 70% ethanol as well as fresh material from the field. Abbreviations in the specimen citations are LA (Logging Area), Mt (Mountain, except where an official name), NP/NPR (National Park/National Park Reserve), TR (Timber Reserve).

## Taxonomy

***Aglaia monticola*** W.E.Cooper & P.I.Forst. **sp. nov.**

Similar to *Aglaia brassii* Merr. & L.M.Perry but differs by the shorter leaf rachis and petiole (15–65 mm vs. 100–140 mm); pulvinus on lateral petiolules (present vs. absent); fewer leaflets (3 [rarely 4] vs. 5 [rarely 7]); leaflet indumentum (stellate hairs and stellate scales vs. stellate hairs and stellate and fimbriate scales); leaflet surface abaxially with lateral veins distinctly raised (vs. flat or slightly raised); longer inflorescence peduncle length (30–85 mm vs. 7–23 mm); longer flower pedicel length (5–6 mm vs. 0.5–1 mm) and flower shape (ovoid-oblate vs. ellipsoid).

**Typus:** Queensland. COOK DISTRICT: Brooklyn, Australian Wildlife Sanctuary, Mt Lewis, 9 October 2020, *W. Cooper 2694 & L. Morris* (holo: CNS 150993 [2 sheets CNS 150993.1 and CNS 150993.2 + spirit], iso: BRI, CANB, FRI, K, L, MO, *distribuendi*).

[*Aglaia brassii* auct. non Merr. & L.M.Perry; Pannell (1992, 2013); Cooper & Cooper (2004: 284); Zich *et al.* (2018)].

**Illustrations:** Cooper & Cooper (2004); Zich *et al.* (2018); (all as *A. brassii*).

**Tree** to 20 m, dbh to 75 cm; bark reddish-brown, finely fissured and slightly flaky; branchlets and twigs glabrous; new growth pale green. **Leaves** compound, alternate; rachis + petiole 15–65 mm long, with dense pale to dark coppery stellate scales interspersed with a few pale fawn coloured stellate hairs, primary pulvinus 2.5–4 mm long. **Leaflets** 3 (rarely 4), all with petiolules and pulvini; lateral petiolules 6–13 mm long; terminal petiolules 16–35 mm long; pulvini 4–5 mm long; petiolules and pulvinulus grooved adaxially and with dense coppery stellate scales; lamina elliptical or oblong-elliptical, 70–180 mm long, 20–60 mm wide; base cuneate, sometimes slightly asymmetrical; apex acuminate; margin entire; adaxially with numerous small pits, glabrous or with sparse, rusty stellate scales or hairs; abaxially with rusty and fawn stellate scales or hairs denser along primary vein, newer leaflets scabrid on underside; discolourous, being dark green adaxially, paler green abaxially; venation brochidodromous; primary vein distinctly grooved on dried specimens; secondary veins 9 or 10 pairs, raised on both surfaces; tertiary venation reticulate. **Inflorescence** a pendulous axillary panicle 80–220 mm long; rachis slender, diameter to 1 mm; bracts solitary and present at peduncle bases, part way along and at apex, triangular, *c.* 0.65 mm long and 0.75 mm wide, base truncate, apex acute, densely clothed in rusty stellate scales; peduncles 30–85 mm long. **Flowers** may be slightly fragrant, male and females similar, ovoid-oblate 3.25–3.5 mm long and 3–4.5 mm wide; pedicels 2.5–4 mm long, narrowly obconical; calyx 5-lobed, shortly cupular, lobes broadly ovate, *c.* 1 mm long and 1.5 wide, green, with rusty and pale fawn stellate scales; petals 5, quincuncial, elliptic-orbicular and concave, *c.* 2.5 mm long, 2.2–3 mm wide,

yellow or orange-yellowish, glabrous or a few stellate scales sometimes present, margin thin, repand and sometimes ciliate; staminal tube ovoid or oblate, *c.* 2.5 mm long, aperture diameter 1–1.5 mm; anthers ovoid, inserted half or mostly  $\frac{2}{3}$  the way up the tube and just protruding above aperture, 1.25–1.5 mm long, glabrous; ovary oblate, 0.65–1 mm high, 0.75–1.1 mm wide, with dense silvery stellate hairs, 2-locular; stigma 2-lobed, 0.5–0.7 mm high, 0.6–1 mm wide; ovules 1 per locule. **Fruiting pedicel** *c.* 5 mm long. **Fruit** a 2-locular drupe, pear-shaped, up to 33.5 mm long, 26.5 mm  $\times$  22 mm wide, yellow-orange or orange, with stellate scales. **Seeds** 1 or 2, up to 21 mm long and 9  $\times$  12 mm wide, testa black; aril translucent whitish and completely enclosing seed. **Figs. 1 & 2.**

**Additional selected specimens (from 64 examined):**  
**Queensland.** COOK DISTRICT: TR 165, Noah, Pieter Botte LA, upper slopes of Mt Pieter Botte, Sep 1997, *Ford 1977* (CNS); Daintree NP, NW of Black Mt, May 1998, *Forster PIF22901 et al.* (BRI); Daintree NP, Black Mt area, Daintree River headwaters, May 1998, *Forster PIF22963 et al.* (BRI); SFR 143, Cow LA, near Schillers Hut, Sep 1996, *Ford 1769* (CNS); Mt Misery, on Mt Carbine Tableland, Sep 1972, *Webb & Tracey 11702* (BRI); Mt Misery, E of Mt Spurgeon, Nov 1988, *Jessup et al. GJM904* (BRI); SFR 143, Kanawarra, Carbine LA, Mar 1988, *Hyland 25411RFK* (BRI, CNS); SFR 143, Kanawarra, Carbine LA, Nov 1987, *Hyland 25245RFK* (BRI, CNS); *ibid.*, Nov 1990, *Hyland 14081* (BRI, CNS); 13.5 km along Mt Lewis road, Nov 1995, *Forster PIF18111 et al.* (BRI, CNS); TR 66, 11 km along Mt Lewis Road, Nov 2001, *Forster PIF27686 et al.* (A, BISH, BRI, L, MEL, NSW, NY, Z); Brooklyn Station, track near Blue-faced Parrot Finch site, Mt Lewis, Sep 2016, *Cooper 2329 & Pannell* (CNS); Brooklyn, near Blue-faced Parrot Finch site, Mt Lewis, Nov 2016, *Cooper 2378 & Pannell* (CNS); *ibid.*, Nov 2016, *Cooper 2379 & Pannell* (CNS); SFR 143, Lerra LA, 5.6 km from Bushy Creek bridge, Apr 1997, *Ford 1892* (CNS); Mt Lewis, Oct 1971, *Webb & Tracey 11937* (BRI); Bunya site, Mt Lewis, Oct 1973, *Webb & Tracey 13729* (BRI, CNS); Mt Lewis Range, 1 mile S of main ridge of Mt Lewis, Oct 1964, *Schodde 4148* (BRI, CANB).

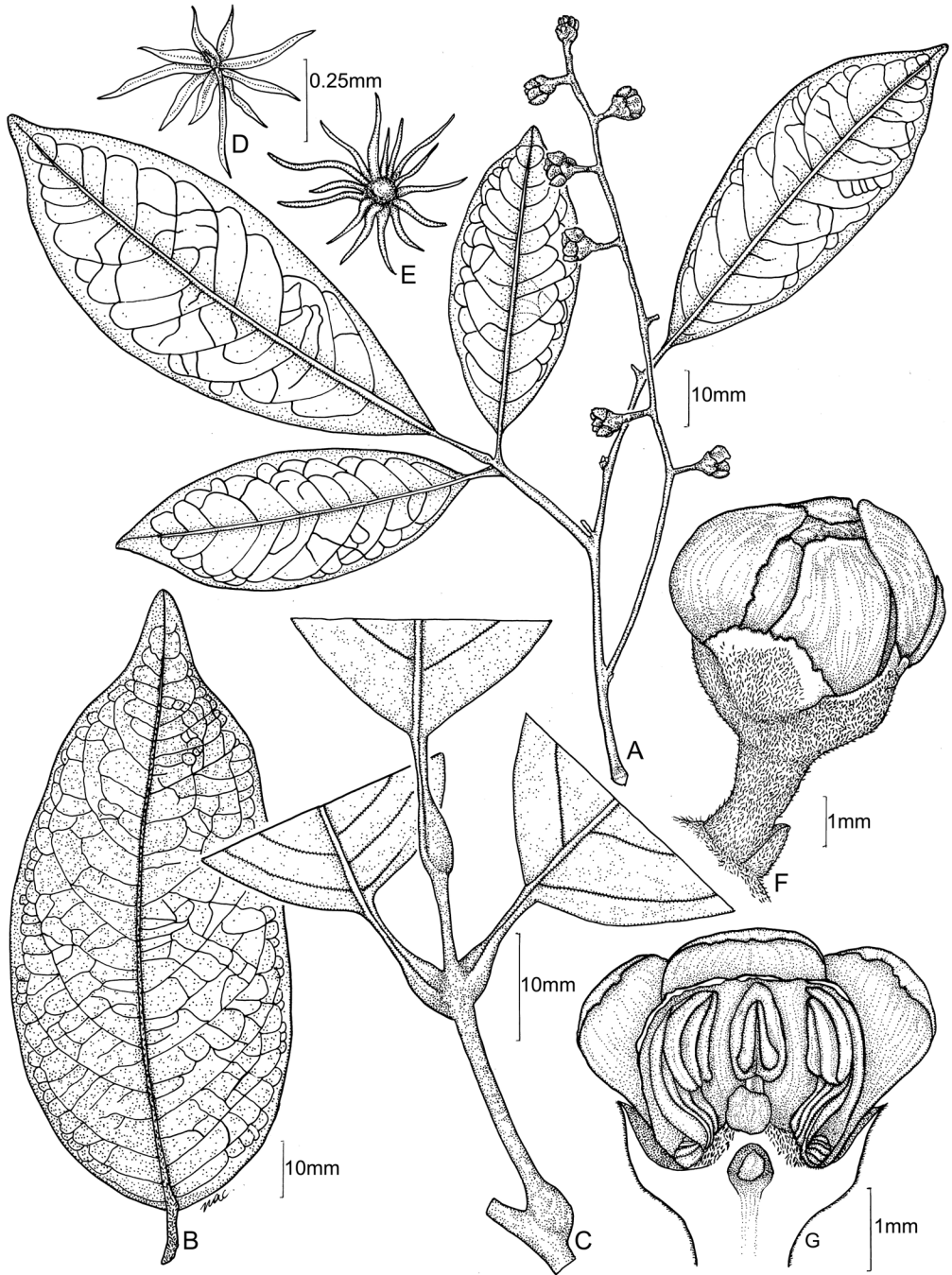
**Distribution and habitat:** *Aglaia monticola* is endemic to montane rainforest in the Wet Tropics bioregion in north-east Queensland, where it is currently known to occur at about five general localities (Mt Lewis, Mt Spurgeon, Mt Misery, Black Mountain and Mt Pieter Botte) at altitudes from 600–1200 m (**Map 1**). These localities are all north of the Black Mountain Corridor (BMC) (Bryant & Krosch 2016).

*Aglaia monticola* grows as a small tree in the understory of complex mesophyll and notophyll vineforest on soil derived from granite. It co-occurs commonly at the Mt Lewis localities with *Agathis atropurpurea* B.Hyland, *Aglaia meridionalis* Pannell, *Argyrodendron trifoliolatum* F.Muell., *Athertonia diversifolia* (C.T.White) L.A.S.Johnson & B.G.Briggs, *Cupaniopsis flagelliformis* (F.M.Bailey) Radlk., *Elaeocarpus grandis* F.Muell., *Endiandra bessaphila* B.Hyland, *E. inopinata* B.Gray, *Garcinia warrenii* F.Muell., *Oraniopsis appendiculata* (F.M.Bailey) J.Dransf., A.K.Irvine & N.W.Uhl, *Prunus turneriana* (F.M.Bailey) Kalkman, *Sloanea langii* F.Muell. and *Synima macrophylla* S.T.Reynolds.

**Phenology:** Flowers have been recorded in October and November and fruits have been recorded in March and April.

**Affinities:** *Aglaia monticola* was previously included within Pannell's (1992) species concept for *A. brassii* from the Solomon Islands and New Guinea lowlands. The habitat, indumentum, leaves, flowers and seeds differ between the two species; however, they are superficially similar and may share a common lineage.

**Etymology:** The specific epithet *monticola* is derived from the Latin *monti-* (mountain) and *-cola* (dweller), referring to the plant's habitat.



**Fig. 1.** *Aglaiia monticola*. A. branchlet with flowers and young leaf. B. abaxial leaflet surface showing venation. C. leaflet bases showing pulvini. D. stellate hair. E. peltate scale. F. flower from side. G. half flower showing stamens, style, ovary and ovule. Scales as indicated. A, E–G from Forster PIF27686 *et al.* (BRI); B, C & D from Hyland 14081 (BRI). Del. N. Crosswell.

### Key to *Aglai*a species in Australia

- 1 Indumentum comprising stellate hairs consisting of rays of two lengths, one whorl around the base of each cluster being noticeably shorter than the central more erect rays . . . . . **A. ferruginea**
1. Indumentum of stellate hairs or peltate scales; if stellate hairs they consist of rays all of a similar length . . . . . 2
- 2 Leaflets with secondary veins reaching and curving at the margins and not forming loops (camptodromous) or may form complete loops at the margin but only towards apex. . . . . 3
2. Leaflets with secondary veins looping well within the margins (brochidodromous) . . . . . 6
- 3 Leaves with 11–21 leaflets. . . . . **A. spectabilis**
3. Leaves with 3–9 leaflets. . . . . 4
- 4 Leaflets with numerous stellate hairs or scales dividing into rays near the central attachment . . . . . **A. brownii**
4. Leaflets with fimbriate or stellate scales that have a broad centre with short rays up to half the radius of the scale. . . . . 5
- 5 Calyx lobes scarcely 5-lobed . . . . . **A. euryanthera**
5. Calyx lobes deeply divided into 5 or 6 lobes . . . . . **A. sapindina**
- 6 Leaflets adaxially with white indumentum which may be sparsely interspersed with rusty scales . . . . . 7
6. Leaflets adaxially with silvery, rusty, brown or purplish indumentum . . . . . 8
- 7 Leaves with 9–19 leaflets; lateral leaflets with cordate or cuneate bases; secondary veins comprising 11–25 pairs . . . . . **A. argentea**
7. Leaves with 1–7 leaflets; lateral leaflets with attenuate or cuneate bases; secondary veins comprising 5–10 pairs . . . . . **A. eleagnoidea**
- 8 Lateral leaflet bases extremely asymmetrical . . . . . **A. silvestris**
8. Lateral leaflet bases symmetrical or occasionally indistinctly asymmetrical . . . . . 9
- 9 Leaves with usually 3 (rarely 4) leaflets; petiolules with distinct pulvinus at base which is much thicker than the petiolule; occurs in the Wet Tropics bioregion . . . . . **A. monticola**
9. Leaves with 5–13 (rarely 3 or 4) leaflets; petiolules without a distinct pulvinus . . . . . 10
- 10 Leaves with up to 7 leaflets; occurs E of McIlwraith Range in Cape York Peninsula bioregion . . . . . **A. cooperae**
10. Leaves with 9–13 leaflets; occurs S of Cooktown in Wet Tropics bioregion. . . . . 11
- 11 Leaflets with 6–14 pairs of lateral veins; petiole + rachis with moderate to sparse indumentum of minute, dark purplish fimbriate scales. . . . . **A. australiensis**
11. Leaflets with 11–25 pairs of lateral veins; petiole + rachis with dense rusty stellate hairs or scales . . . . . **A. meridionalis**





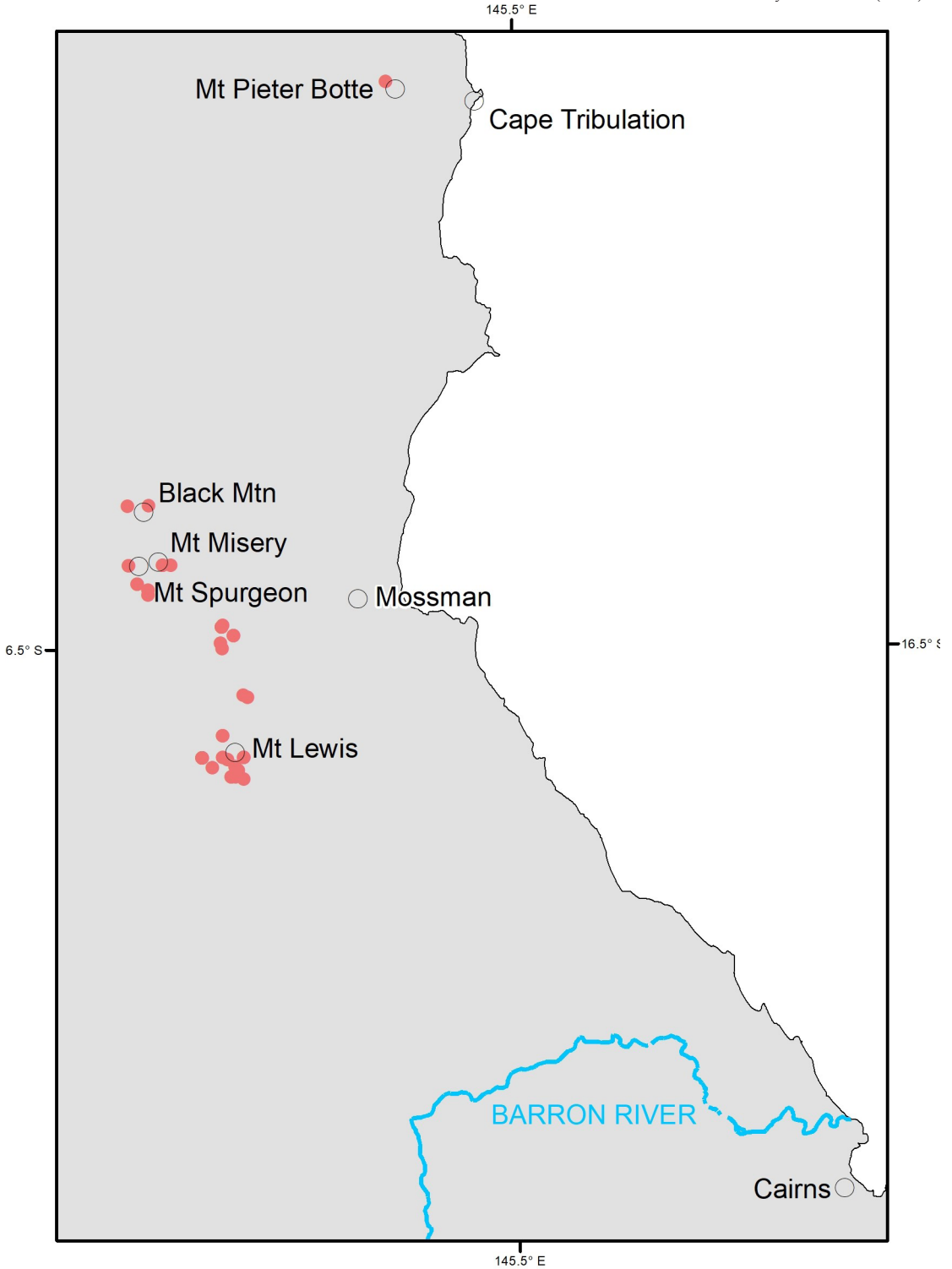
Fig. 2. *Aglaia monticola* flowers. (Cooper 2694 & Morris, CNS). Photo R. Jensen.

### Acknowledgements

The first author is grateful to Lucy Morris for field assistance to collect the type specimen of *Aglaia monticola*. I also thank Tim Hawkes and Rigel Jensen for field assistance, Steve Murphy for the map, Darren Crayn and Frank Zich for support and access to CNS herbarium and Australian Wildlife Conservancy for permission to collect on their property. Permits to collect material were issued by the Queensland Government to the Australian Tropical Herbarium at Cairns (CNS) and its precursor institution at Atherton (QRS) enabling staff or designated associates to collect herbarium samples from state lands. The line drawings in Fig. 1 were skillfully executed by Nicole Crosswell.

### References

- BRYANT, L.M. & KROSCH, M.N. (2016). Lines in the land: a review of evidence for eastern Australia's major biogeographical barriers to closed forest taxa. *Biological Journal of the Linnean Society* 119: 238–264.
- COOPER, W. & COOPER, W.T. (2004). *Fruits of the Australian Tropical Rainforest*. Nokomis Editions: Melbourne.
- FORSTER, P.I., BOSTOCK, P.D., BIRD, L.H. & BEAN, A.R. (1991). *Vineforest Plant Atlas for South-East Queensland*. Queensland Herbarium: Indooroopilly.
- PANNELL, C.M. (1992). *A taxonomic monograph of the genus Aglaia Lour.* Royal Botanic Gardens, Kew: London.
- (2013). *Aglaia*. In A. Wilson (ed.), *Flora of Australia* 26: 33–42. Australian Biological Resources Study/CSIRO Publishing: Canberra/Melbourne.
- ZICH, F., HYLAND, B.P.M., WHIFFIN, T., KERRIGAN, R.A. (2018). *Australian Tropical Rainforest Plants*, Edition 7. <http://www.canbr.gov.au/cpbr/cdkeys/RFK7/key/RFK7/Media/Html/entities/index.htm>



Map 1. Distribution of *Aglaia monticola*.