

The genus *Kania* (Myrtaceae, Kanieae) in the Philippines

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Abstract

A review of the Philippine species of *Kania* Schltr. (Myrtaceae, Kanieae) is presented, including the description of a new species, *Kania allochroa* Fernando & Peter G. Wilson. *Tristania microphylla* Quisumb & Merr. (*Kania microphylla* (Quisumb. & Merr.) Peter G. Wilson) and *Photinia urdanetensis* Elmer (*Kania urdanetensis* (Elmer) Peter G. Wilson) are lectotypified.

Introduction

Kania Schltr. is a genus of capsular-fruited species of Myrtaceae now placed in the monogeneric Tribe Kanieae Engl. with about 10 species and is, on present knowledge, restricted to New Guinea and the Philippines (Wilson *et al.* 2022). *Kania* is one of only a few genera in the Philippines with an East Malesian- or Papuasian-centred distribution pattern, approximately equivalent to distribution type 5b of van Balgooy (1971). The few genera that show a very similar pattern represent various families and include *Dolicholobium* (Rubiaceae) (Jansen and Ridsdale 1983), *Heterospatha* (Arecaceae) (Baker and Couvreur 2012), *Loheria* (Primulaceae) (Stone 1991), and *Saranga* (Pandaceae) (Stone 1961).

Kania is characterised by stamens arranged in a single whorl on the rim of the hypanthium, anthers with elongated connectives, and ovules with basal placentation (Wilson 1982). The two Philippine species were for a long time known only from their type collections until one of them was recollected recently. That species, *Kania microphylla* (Quisumb. & Merr.) Peter G. Wilson was first collected on Mt Alzapan, Nueva Vizcaya Province on Luzon Island nearly a century ago in May 1925. In July of 2023, the first author discovered this species growing on ultramafic substrate at low elevation near the southern end of the adjacent province of Isabela. The second species, *Kania urdanetensis* (Elmer) Peter G. Wilson, endemic to Mt Urdaneta on the northeastern part of Mindanao Island, has not been recollected since the type gathering in September 1912. In this paper, we review the genus as it occurs in the Philippines, update the descriptions of the two previously known species and designate lectotypes for them. Types were specified for both names but, according to the principles outlined by McNeill (2014), no holotype could be identified and so lectotypes were chosen in accordance with Art. 9.3 of the *International Code of Nomenclature* (Turland *et al.* 2018). The new species was discovered on ultramafic substrates on Mt Redondo, Dinagat Island, just north of Mindanao. We describe this species as *Kania allochroa* and provide notes on its ecology and conservation status.

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Materials and methods

All new material studied was collected by the first author. Initial observations were made on living material and confirmed and supplemented by additional measurements of dried herbarium specimens and inflorescences and flowers preserved in 70% ethanol. Characters in the descriptions were defined as in Beentje (2016). Herbarium acronyms follow Thiers (2024, updated continuously). To determine conservation status, we used the geospatial conservation assessment tool GeoCAT (Bachman *et al.* 2011; <http://geocat.kew.org>) to calculate the extent of occurrence (EOO) and area of occupancy (AOO) for the species as specified in the IUCN Red List Criteria and Categories (IUCN 2012) and IUCN Guidelines (IUCN Standards and Petitions Committee 2022).

Taxonomy

Kania allochroa Fernando & Peter G. Wilson, sp. nov.

Type: PHILIPPINES: Dinagat Island: Municipality of Loreto, Mount Redondo, 814 m elevation, in open dwarf forest on ultramafic soil, flower buds and open flowers, 12 Apr 2023, *E.S. Fernando 5348* (holotype: PNH; isotypes: LBC + spirit coll., NSW, PUH, SING).

Diagnosis: This species is most similar to *Kania urdanetensis* but differs in having thicker leaves with acute to obtuse, (vs. acuminate) apices and somewhat obscure secondary venation and flowers with longer petals (3–3.5 vs. c. 2.5 mm long) and styles (c. 4.5 vs c. 1.5 mm long).

Shrub or small *tree*, 3–5 m tall, glabrous; stem 5–10 cm diameter near the base; outer bark smooth to sparsely fissured-scaly; branches mostly upright; young twigs not distinctly angular. *Leaves* simple, opposite and decussate; petiole (2.5–) 3–6 (–7.5) mm long, c. 1.5–2.5 mm thick, more or less flat on the adaxial side, convex on the abaxial side; base obtuse to rounded; apex acute to obtuse; lamina coriaceous, broadly elliptic, rarely obovate or ovate, (15–) 20–35 (–37) mm long, (7–) 10–20 (–25) mm wide, the midrib very prominent on both surfaces; margins slightly thickened and revolute; the abaxial surface pubescent; secondary veins 12–20 on each side of the midrib, rather obscure on abaxial surface (*in vivo*), or distinct or faintly so on both surfaces (*in sicco*); intramarginal vein faintly visible on abaxial side, c. 0.3 mm from the margin; margin revolute; young leaves light reddish-brown, then pale white to green, to very densely white-pubescent on both surfaces, mature leaves glabrescent. *Inflorescence* a simple cyme or a compound dichasial cyme, axillary, 3–3.5 cm long, with up to 3–18 flower buds; peduncle 2–4 (–6) mm long, pubescent, sometimes subtended at base by leaf-like bracts, 2–3 mm long, 1–2 mm wide; frequently two inflorescences are produced per node, one in each axil; flower buds subglobose, c. 4 mm wide, densely pubescent, the petals and sepals imbricate in bud. *Flower* 5-merous, c. 7 mm wide when fully open; pedicel 1–2.5 mm long; sepals 3 mm long, 2–3 mm wide, spreading, the abaxial surface densely hairy, sepals persistent to fruiting stage; petals 3–3.5 mm long, 2.5 mm wide, pale pink-orange, turning to yellow or creamy-white with age, arrow-head (deltate) shape with a distinct basal part, the abaxial side pubescent along the midvein. *Stamens* 15–20, arranged in a continuous ring in front of the petals on the rim of the hypanthium, sometimes inequidistant from each other, but not distinctly grouped; filament 2–3.5 mm

long, light yellow to white, more or less terete at the base and tapering apically; anther with prominent elongated connective, about as long as anther cells. *Ovary* subglobose, half-inferior, the free exposed part densely covered in brown indumentum, 3-locular; style terminal on the ovary, filiform, 4.5 mm long; stigma punctiform; placentation basal, ovules elongated (linear), anatropous, c. 9–11 per locule. *Fruit* a dry capsule, subglobose, 5 mm long, 7–8 mm wide, with sparse, appressed indumentum on the surface, 3-locular; calyx spreading, persistent; seed not known. Figures 1–2.

Distribution: Endemic to the Philippines. This species is, thus far, known only from the type locality on Mt Redondo, Dinagat Island.

Etymology: The epithet *allochroa* is from the (Latinized) Greek, *allochrous*, meaning ‘changed in colour’, referring to the changing colour of the petals as the flower opens and matures (Figures 1D, E).

Habitat and ecology: This species occurs in dwarf, usually dense forest on ultramafic soil, 733–840 m elevation. The associated woody species in the habitat of this species include the widespread *Leptospermum amboinense* Blume (Myrtaceae), *Decaspermum* sp. (Myrtaceae), *Ixonanthes reticulata* Jack (Ixonanthaceae), *Psychotria surigaoensis* Sohmer & A.P. Davis (Rubiaceae), *Tristaniopsis flexuosa* Fernando & Peter G. Wilson (Myrtaceae), *Dacrydium beccarii* Parl. (Podocarpaceae), *Osmoxylon dinagatense* (Merr.) Philipson (Araliaceae), *Syzygium crassissimum* (Merr.) Merr. (Myrtaceae), *Croton leiophyllus* Müll. Arg. (Euphorbiaceae), and *Nepenthes mindanaoensis* Sh. Kurata (Nepenthaceae), among other plants. Shrubby plants of *Kania allochroa* at its type locality on Mt Redondo were seen to be flowering even when barely over a meter tall (Figure 1B). Fully mature trees tend to have rather dense crowns. *Kania allochroa* was observed to be flowering in April and fruiting in September.

Other specimens examined: Philippines. Dinagat Island: Municipality of Loreto, Mount Redondo, 733 m elevation, in dwarf forest on ultramafic soil, flower buds and open flowers, 12 Apr 2023, *E.S. Fernando 5335* (LBC, NSW, PNH, SING), *E.S. Fernando 5338* (LBC + spirit coll., PNH), 817 m elevation, flower buds, 12 Apr 2023, *E.S. Fernando 5356* (LBC), 840 m elevation, mature fruits, 29 Sep 2015, *E.S. Fernando 3837A* (LBC).

Notes: *Kania allochroa* is the sixth new species of flowering plant described from Mt Redondo since 2018. The five other species earlier described from this mountain include species in the genera *Medinilla* (Melastomataceae) (Fernando *et al.* 2018), *Nepenthes* (Nepenthaceae) (Robinson *et al.* 2019), *Tristaniopsis* (Myrtaceae) (Fernando and Wilson 2021), *Alpinia* (Zingiberaceae) (Docot *et al.* 2022), and *Vaccinium* (Ericaceae) (Tamayo *et al.* 2023). The Mt Redondo area on Dinagat Island has been, and remains, a mining concession but mining operations have been suspended since February 2017. Consequently, this site has only recently been accessible to botanists, with appropriate government permits, to undertake short term research on the flora. It is likely that many more species remain to be discovered in the dwarf forest on this small ultramafic mountain.

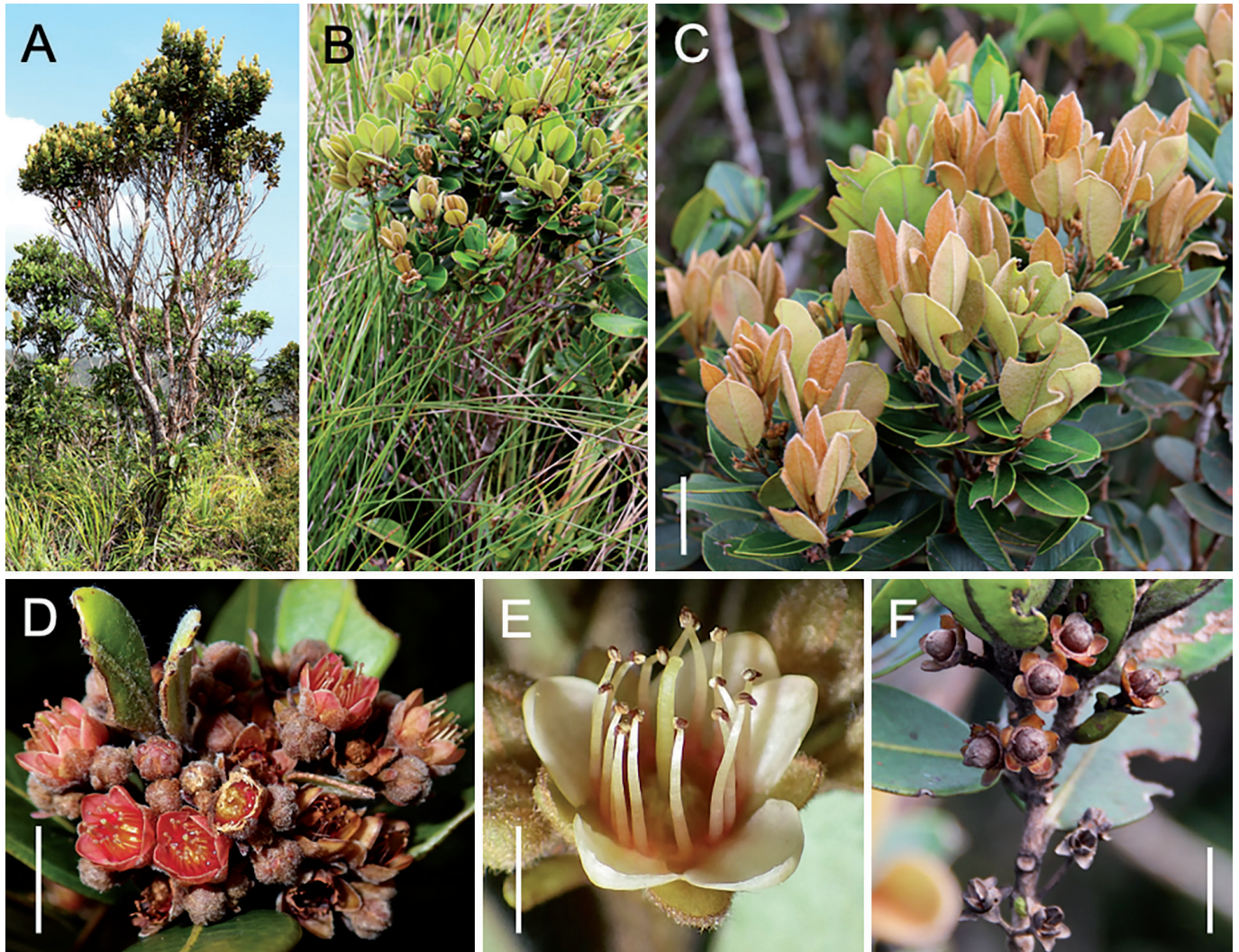


Figure 1. *Kania allochroa* Fernando & Peter G.Wilson. **A.** Tree at type locality showing growth habit. **B.** Small tree habit at just over a meter tall but already flowering, growing with the sedge *Machaerina disticha* (Cyperaceae). **C.** Branch showing young leaf growth. **D.** Cluster of flowers and flower buds with the newly opened flowers (bottom left of photo) showing pale pink-orange petals. **E.** Close up of fully opened flower with light yellow to creamy-white petals and stamens in a single whorl on the rim of the hypanthium showing anthers with elongated connectives. **F.** Fruiting branch showing mature, unopened fruits (top part of photo) with persistent sepals and dehiscent fruits (bottom part of photo). A, D from E.S. Fernando 5348; B from E.S. Fernando 5356; E from E.S. Fernando 5335; F from E.S. Fernando 3837A. Scale bars: C = 30 mm; D, F = 10 mm; E = 3 mm. All photographs by Edwino S. Fernando.

Provisional conservation assessment: All collections of *Kania allochroa* cited here are only from five adjacent localities between 700 and 850 m elevation on Mt Redondo; no plants were recorded from lower slopes. Using the online GeoCAT conservation assessment tool (Bachman *et al.* 2011; <http://geocat.kew.org>), we calculated an Extent of Occurrence (EOO) below 100 km², which is within threshold for the category of Critically endangered (CR) and Area of Occupancy (AOO) of 20 km², within the threshold for the category of Endangered (EN). However, the entire summit area of the mountain is less than 6 km² (Lillo *et al.* 2019) and the species is known, thus far, only from this site. Although this whole area, including Mt Redondo and its adjoining Mt Kambinliw, is listed as a Key Conservation Site PH081 (Mallari *et al.* 2001), it remains within a mining concession and some parts of it have previously been dug open to mine for chromite. A continuing decline is inferred or projected in the (i) extent of occurrence; (ii) area of occupancy; and (iii) area, extent and/or quality of habitat due to the possibility of further mining and other development activities on site. Following IUCN (2012) and the *Guidelines for Using the IUCN Red List Categories and Criteria*

(IUCN Standards and Petitions Subcommittee 2019), we regard this species as Critically Endangered CR B1ab(ii,iii)+2ab(i,ii,iii).

Kania microphylla (Quisumb. & Merr.) Peter G.Wilson, *Blumea* 28: 179 (1982).

Tristania microphylla Quisumb. & Merr., *Philipp. J. Sci., Bot.* 36: 176 (1928).

Type: PHILIPPINES: Luzon Island: 'Nueva Vizcaya Province, Mt Alzapan', 'on slopes in the mossy forest', 1700 m elevation, 21 May 1925, M. Ramos & G. Edaña BS 45613 (Lectotype: (designated here) UC [barcode UC329915]; isolectotypes A [A00071587], NTUF [F00004819], NY [NY03090993], P [P05227642], US [US118324]). Figure 3.

Small tree, 3 m tall, glabrous; stem c. 7 cm diameter near the base; outer bark with transverse ridges and randomly cracking in small pieces; branches mostly upright; young twigs or branchlets not distinctly angular, red-brown appressed-pubescent. Leaves simple, opposite and decussate; petiole (1–) 3–8 mm long, 1.2–2.0 mm thick; lamina subcoriaceous,

narrowly oblong-lanceolate to oblong-elliptic, (15–) 30–50 mm long, (6–) 10–25 mm wide, the abaxial surface pubescent; base cuneate to attenuate; apex acute to attenuate; secondary veins 16–24 on each side of the midrib, rather obscure on abaxial surface (*in vivo*), or distinct or faintly so on both surfaces (*in sicco*); intramarginal vein only faintly visible on adaxial surface, very close to margin; margin revolute; young leaves light reddish-brown, then pale green to green. *Inflorescence* a simple cyme, dichasial cyme, or thyrsoïd, axillary, or sometimes appearing subterminal, 1.3–2.7 cm long, with up to 3–20 (–27) flower buds; flowers usually in triads, red-brown pubescent; peduncle 4–9.5 mm long; flower buds subglobose, pubescent, 2 mm diameter. *Flower* 5-merous, 4–6 mm wide when fully open;

pedicel c. 2 mm long; sepals unequal, 1–1.5 mm long, pubescent; petals yellow, orbicular rounded, c. 2 mm long. *Stamens* 15–20, in a single series on the rim of the hypanthium, filament 1.5–2 mm long, anther connective about half the length of anther cells; glabrous, 2.0–2.25 mm long, 2.0–2.5 mm broad. *Ovary* half-inferior, 3-locular, the free, exposed part pubescent; style c. 2.5 mm long, stigma ± capitate; ovules anatropous, 12–17 per locule. *Fruit* not known.

Other specimen examined: Philippines: Luzon Island, Isabela Province, Dinapigue, c. 600 m elevation, in forest on ultramafic soil, 6 Jul 2023, *E.S. Fernando* 5471 (LBC, PNH, PUH, NSW, SING).

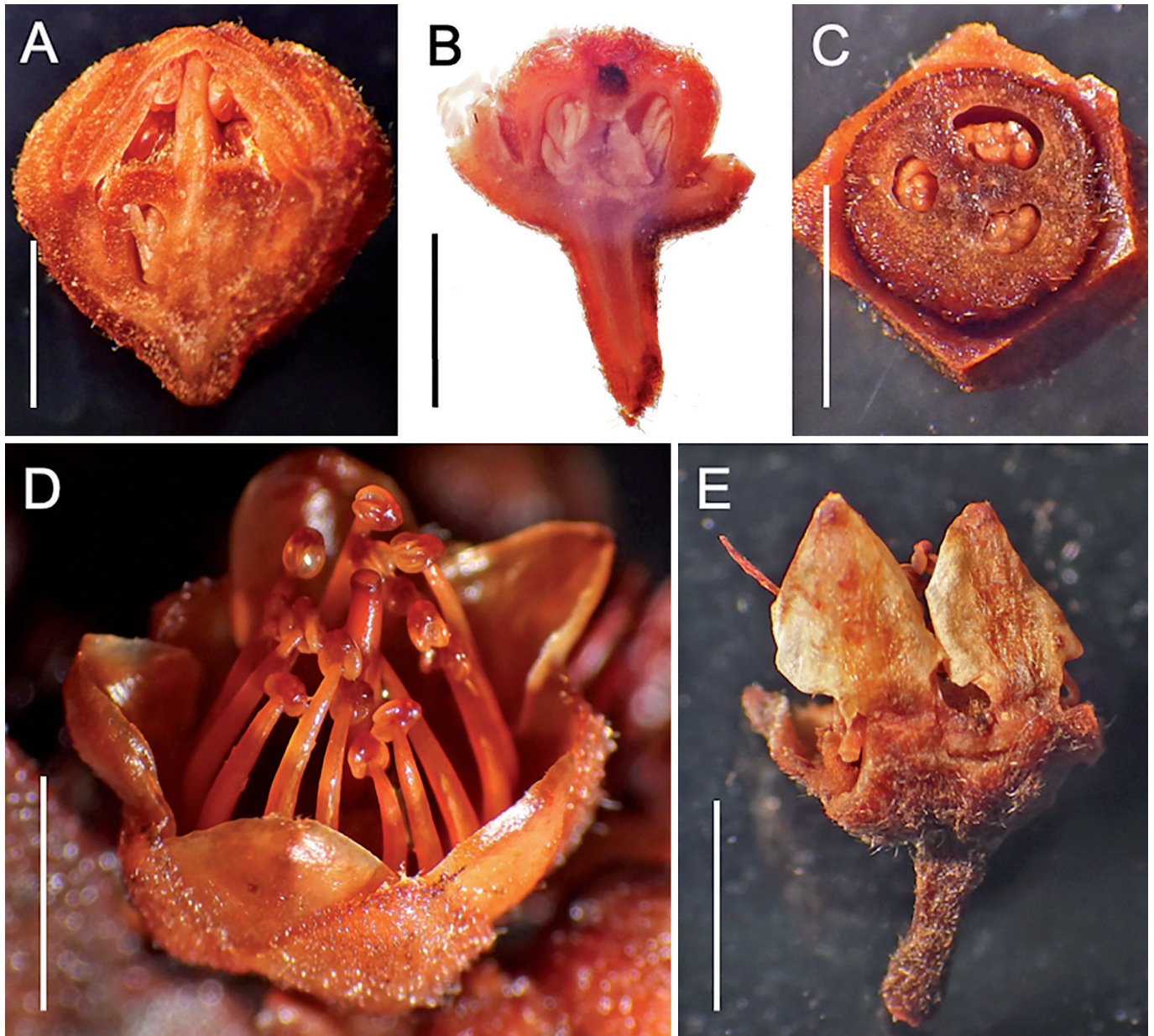


Figure 2. *Kania allochroa* Fernando & Peter G. Wilson. **A.** Longitudinal section of flower bud showing basal placentation in ovary. **B.** Longitudinal section of open flower with sepals and petals removed also showing basal placentation in ovary. **C.** Transverse section of open flower with sepals and petals removed showing 3-locular ovary. **D.** Newly opened flower showing anthers with the elongated connectives. **E.** Flower with the sepals removed to show the deltate shape of petals when flat, the hairy abaxial surface along the midvein, and distinct attachment. A–E all from *E.S. Fernando* 5348, material in spirit collection. Scale bars: A–C = 2 mm; D–E = 3 mm. All photographs by Edwino S. Fernando

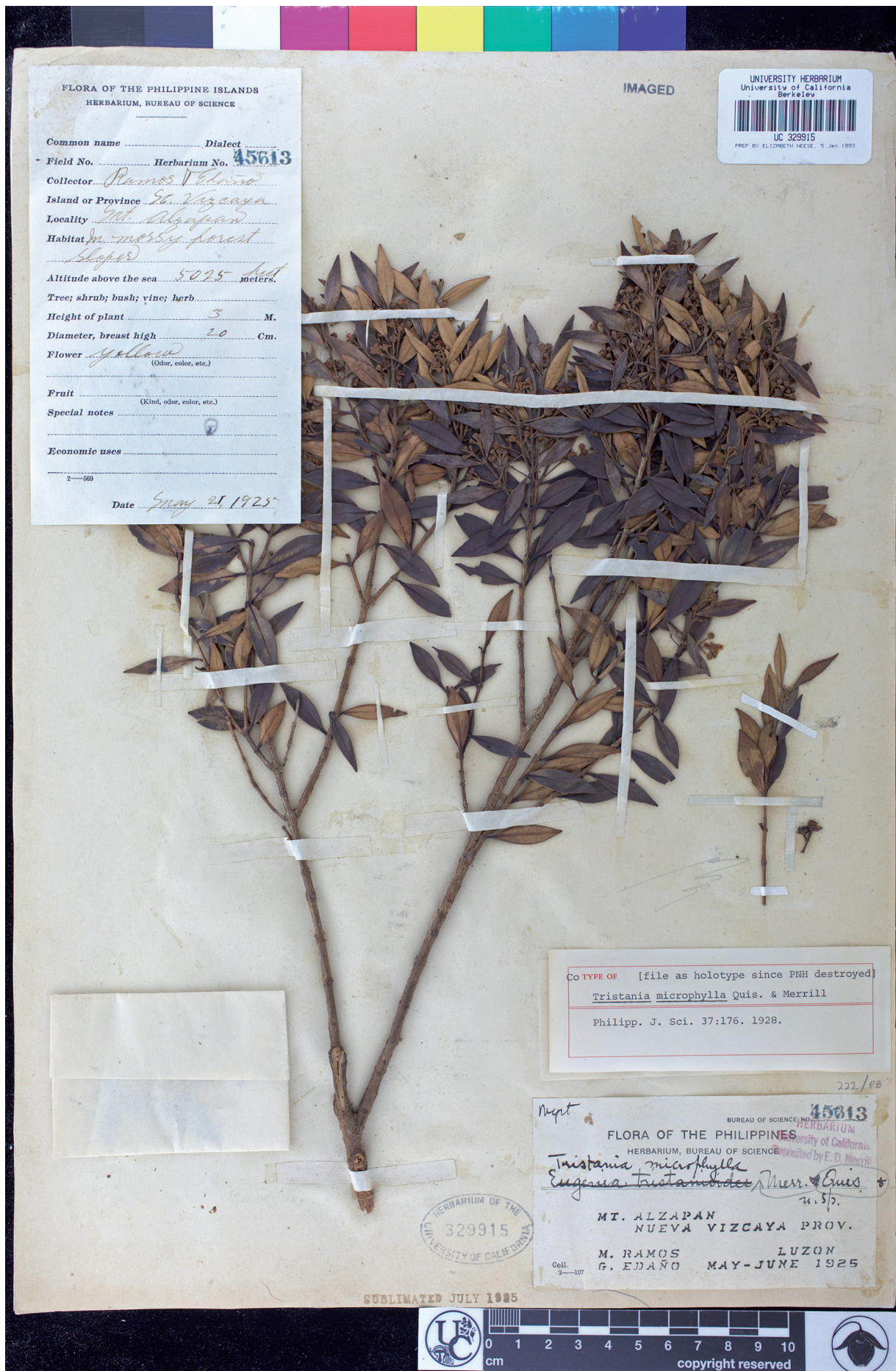


Figure 3. Lectotype of *Tristania microphylla* Quisumb. & Merr. (UC329915; reproduced courtesy of The University & Jepson Herbaria, University of California, Berkeley).

Typification: We have chosen the duplicate specimen at UC as lectotype because it bears Ramos and Edaño's original handwritten collection notes.

Notes: M. Ramos and G. Edaño, plant collectors from the then Bureau of Science, made collections on Mt Alzapan in May–June 1925. Herbarium labels for some of their collections place Mt Alzapan in Nueva Vizcaya Province (e.g. Quisumbing and Merrill 1928; Bramley 2013), while other collections of theirs place Mt Alzapan in Tayabas Province (e.g. Sohmer and Davis 2007; Cheek and Jebb 2013). Tayabas was officially renamed Quezon Province in 1946 and subsequently, in 1979, the northern part was segregated as Aurora Province and the southern part as Quezon Province. Unfortunately, the exact locality of Mt Alzapan remains uncertain; it is not currently shown on any Philippine map or gazetteer. The recent collection of *Kania microphylla*, cited above, was made at Dinapigue in the southeastern part of Isabela Province near the border with present-day Aurora Province. This location is certainly in the same general area where Ramos and Edaño made their collection.

Provisional conservation assessment: Apart from the two cited collections, there is a third, unvouchered, record of this species made by the first author (ESF) during an unplanned visit to the southern part of the national park at a time when he did not have a current permit. No collections were made but photographs were taken. This third site is also within the Municipality of Dinapigue and is approximately 5–6 km northwest of the second locality. The plants occurred in dwarf forest, also on ultramafic soil, well above 830 m on the summit plateau of the southern end of the Northern Sierra Madre Natural Park in an area dominated by *Leptospermum amboinense* Blume (Fernando and Quimado 2023). Since this site is within the natural park, this should provide the species with some protection. Since the precise location of Mt Alzapan is uncertain, the exact geographic extent of occurrence (EOO) of the species cannot be calculated. Therefore, we provisionally assign this species the category of Near threatened (NT) given the few known localities.

Kania urdanetensis (Elmer) Peter G. Wilson, *Blumea* 28: 179 (1982).

Photinia urdanetensis Elmer, *Leaflets Philipp. Bot.* 8: 2802 (1915).

Cloezia urdanetensis (Elmer) Merrill, *Philipp. J. Sci., Bot.* 14: 429 (1919).

Mooria urdanetensis (Elmer) Merrill, *Enum. Philipp. Fl. Plants* 182 (1923).

Type: PHILIPPINES: Mindanao Island: Mt Urdaneta, 'along a wind-swept cold and mossy ridge', c. 1670 m elevation, Sep 1912, A.D.E. Elmer 13694, Lectotype (designated here) UC [barcode UC271293]; Isolectotypes A [A00068963], A [A00068964], BISH [BISH576757], F [F422281], HBG [HBG511077], L [L0009524], MICH [MICH1111271], NA [NA27005], NSW [NSW94279], NY [NY436126], P [P03650699], U [U0005082], US [US00097506]. Figure 4.

Shrubby tree, 5 m tall or taller; branches ascending, flexuose, rigid, branching further towards the top; young twigs ridged or 4-angled, whitish to brownish appressed pubescent. Leaves simple, opposite and decussate; petiole mostly 2–4 mm long, c. 1.5 thick, more or less flat on the adaxial side, convex on the abaxial side; base obtuse or tapering to the petiole; apex acuminate; lamina elliptic to ovate, (22–) 30–50 mm long, (9–) 15–25 mm wide, subcoriaceous, the midvein ± level above, convex below; margins somewhat recurved; secondary veins 13–17 (–20), obscure above, distinct below; intramarginal vein visible on adaxial side, very close to the margin; young leaves discolorous, pubescent, yellowish-brown above, mature leaves glabrescent, dark green above, paler below. *Inflorescence* a cyme, dichasial cyme or thyrsoïd, axillary, 8–17 mm long, with 3–15 flower buds; peduncle 3–4.5 (–6) mm long, yellowish-brown pubescent; frequently two inflorescences are c per node, one in each axil; flower buds subglobose, 2.5–3 (–4.5) mm wide, densely pubescent, the petals and sepals imbricate in bud. *Flowers* 5-merous, to c. 8 mm wide when fully open; pedicel 2–3 mm long; sepals c. 2 mm long, 3 mm wide, the abaxial surface pubescent; petals rounded, c. 2.5 mm long, 2.5 mm wide, the abaxial side pubescent along the midvein. *Stamens* 15–20, arranged in a ± continuous ring in front of the petals on the rim of the hypanthium, ± equally spaced; filament 1.5–3 mm long, glabrous, more or less terete at the base and tapering apically; anthers with a prominent elongated connective, as long as or slightly longer than the anther cells. *Ovary* subglobose, half-inferior, the free exposed part densely covered in brown indumentum, 3-locular; style set into a shallow pit on the ovary summit, filiform, c. 1.5 mm long; stigma punctiform; placentation basal, ovules anatropous, c. 12–15 per locule. *Fruit* unknown.

Typification: We have chosen the duplicate specimen at UC as lectotype because it includes a carbon copy of Elmer's field notes and description, is annotated by Merrill with both of his published synonyms, and clearly shows the inflorescences.

Notes: Mt Urdaneta, more currently referred as Mt Hilong-hilong, is also the Key Conservation Site PH083 and is home to the endemic Philippine eagle (Mallari *et al.* 2001), although it is not yet entirely a protected area. Part of this large mountain range between 200 and 1700 m elevation has been declared as the Cabadbaran–Santiago Natural Park, mainly as a watershed for the municipalities of Cabadbaran and Santiago in Agusan del Norte Province (Mallari *et al.* 2001). Mt Hilong-hilong is the type locality for many plant species, especially those collected by A.D.E. Elmer, including *Kania urdanetensis*. However, the mountain remains poorly explored for its plant diversity.

Provisional conservation assessment: This species is still known only from a single collection from its type locality on Mt Hilong-hilong. The Cabadbaran–Santiago Natural Park encompasses the elevation at which the type specimen was collected, and the species may possibly occur there. We provisionally assign this species the category of Near threatened (NT).



Figure 4. Lectotype of *Photinia urdanetensis* Elmer (UC271293; reproduced courtesy of The University & Jepson Herbaria, University of California, Berkeley).

Key to Species of *Kania* in the Philippines

1. Sepals up to 1.5 mm long; petals glabrous abaxially; anther connectives about half the length of anther cells**K. microphylla**
- 1: Sepals 2 mm or longer; petals pubescent on abaxially; anther connectives about as long or longer than anther cells.....**2**
2. Leaf apex obtuse to acute or attenuate; petals 3–3.5 mm long; style 4.5 mm long..... **K. allochroa**
- 2: Leaf apex acuminate; petals 2.5 mm long; style 1.5 mm long.....**K. urdanetensis**

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