BOTANIC GARDENS OF SYDNEY

Telopea

Journal of Plant Systematics

ISSN 2200-4025 (Online)

Burckella coi (Sapotaceae, Isonandreae), a new species and a new generic record for the Philippines and west of the Wallace Line

Edwino S. Fernando[1,2,3,4], Jay E. Matute[1], Jayson A. Mansibang[3], Marilyn O. Quimado[1]

[1]Department of Forest Biological Sciences, College of Forestry and Natural Resources, The University of the Philippines – Los Baños, College, 4031 Laguna, Philippines
[2]Forestry Herbarium, Museum of Natural History, The University of the Philippines – Los Baños, College, 4031 Laguna, Philippines
[3]Biodiversity Research Laboratory, Institute of Biology, College of Science, The University of the Philippines – Diliman, 1101 Quezon City, Philippines

[4]Author for correspondence: esfernando@up.edu.ph

Abstract

Burckella coi Fernando (Sapotaceae) is described as a new species and reported as a new generic record for the Philippines and west of the Wallace Line. The genus was previously only known east of the Wallace Line, from Maluku, New Guinea, Fiji, Samoa, and Tonga in the western Pacific. This new species is similar to a small group of species in the genus *Burckella* Pierre in its growth habit, being a large tree with obovate leaves 10–30 cm long, with many (15–30) secondary nerves and a large number of stamens (25–40). This group includes *B. poolei* H.J.Lam (Maluku and New Guinea), *B. obovata* (G.Forst.) Pierre (Maluku to Solomon Islands), *B. polymera* P.Royen (New Guinea), *B. fijiensis* (Hemsl.) A.C.Sm. & S.P.Darwin (Fiji), and *B. thurstonii* H.J.Lam (Fiji). *B. coi*, however, has 40–50 stamens while there are only 12–16 in *B. obovata*. *Burckella thurstonii* is similar to *B. coi* in having c. 40 or more stamens, but in *B. thurstonii* the pedicel and calyx are densely pubescent and the fruits are larger (c. 5 cm diameter) compared to *B. coi* which has a ±glabrescent pedicel and calyx and smaller fruits (c. 3 cm diameter).

Introduction

The family Sapotaceae in the Philippines is represented by 12 genera and about 62 species (Pelser *et al.* 2025). The largest genus is *Palaquium* Blanco with at least 32 species, followed by *Madhuca* Buch.-Ham. ex J.F.Gmel. with 12 species, and *Planchonella* Pierre with eight species. Most are trees occurring in primary forests from along sandy seashores to lowland and montane habitats up to 1350 m elevation, including on limestone and ultramafics.

During one of our surveys of the flora on ultramafic soils in northeastern Luzon (Fernando and Quimado 2023; Fernando *et al.* 2025), we collected sterile material of a Sapotaceae tree species that looked very similar to those of *Madhuca* and *Palaquium* with the classic *Terminalia*-type branching, and large, simple leaves clustered at the tips of the branchlets. Subsequent collection of fertile material of this same taxon revealed that the young fruits were in fascicles at the very ends of the branchlets, not among the leaves or from leafless nodes behind the leaves. This pseudo-terminal character of the flowers and fruits is typical of another Sapotaceae genus, *Burckella* Pierre (Lam and Van Royen 1952). This genus, with 13 currently accepted species (POWO 2025) is, hitherto, only known east of the Wallace Line from Maluku and New Guinea to Fiji, Samoa, and Tonga in the western Pacific (Lam and Van Royen 1952; Richardson *et al.* 2014; POWO 2025). Our collected fertile material also had persistent styles in the 1-seeded fruits and

Fernando ES, Matute JE, Mansibang JA, Quimado MO (2026) *Burckella coi* (Sapotaceae, Isonandreae), a new species and a new generic record for the Philippines and west of the Wallace Line.
Telopea 30: 69–79.
doi:10.7751/telopea21764

Received: 1 December 2025
Accepted: 25 February 2026
Published: 9 April 2026

four calyx lobes from a single whorl, all characteristic of *Burckella* (Lam and Van Royen 1952; Briggs *et al.* 2021). Subsequently, we found three other herbarium specimens collected earlier from two other sites also in Isabela.

According to Richardson *et al.* (2014) and Phang *et al.* (2025b), *Burckella* belongs in the Tribe Isonandreae, together with six other genera, *viz. Palaquium* Blanco, *Aulandra* H.J.Lam (now transferred to *Palaquium* (Phang *et al.* 2025a), *Isonandra* Wight, *Madhuca* Buch.-Ham. ex J.F.Gmel., *Payena* A.DC., and *Diploknema* Pierre and are defined on the basis of a complex combination of floral characters, including a usually biseriate or uniseriate calyx, undivided corolla lobes, and absence of staminodes (see Gautier *et al.* 2013). *Burckella* is generally characterized by the rather thick branchlets with leaves clustered at their tips, flowers aggregated at the very tips of the branchlets beyond the leaves, exserted corolla, calyx a single whorl of 4 lobes, eight imbricate petals, 4–5-loculed ovary, and fruit with persistent style and usually 1-seeded (Lam and Van Royen 1952; Briggs *et al.* 2021).

In this paper we describe this discovery as *Burckella coi*, a new species and new generic record for the Philippines and west of the Wallace Line.

Materials and methods

Trees were studied in the field and herbarium specimens collected. Preliminary observations were made on fresh material and later additional measurements made on dried, pressed specimens and from material preserved in 70% ethanol. Morphological terminology used in the general plant descriptions follows Beentje (2016); that for seedlings follow Duke (1969) and De Vogel (1980). Digital images of herbarium specimens of closely similar *Burckella* species available at A, K, L, NY, U, and US were also examined. Herbarium acronyms follow Thiers (2025, updated continuously). Taxonomic treatments of *Burckella*, including keys, from adjacent regions, *e.g.* Maluku, New Guinea, Fiji, and Solomon Islands (Lam 1932; Lam and Van Royen 1952; Van Royen 1957, 1967; Smith and Darwin 1975; Smith 1981; Pennington 1991; Lemmens and Sudo 1995) were also consulted. For assessment of conservation status, we used the geospatial conservation assessment tool GeoCAT (Bachman *et al.* 2011; http://geocat.iucnredlist.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).

The following specimen images were examined to supplement descriptions for potentially related species (Table 1):

Burckella fijiensis (Hemsl.) A.C.Sm. & S.P.Darwin — FIJI, Taveuni, Sep 1878, *J. Horne 1140* (Holotype K [K000777922]), Viti Levu, Nandronga and Navosa Prov., 11 Aug 1947, *A.C. Smith 5631* (A [A00961501], L [L.0006121], NY [NY273399], US [US00113215], Type of *Burckella multinervis* Lam, synonym], Naitasiri, Wainimala Valley, 5 Aug 1937, *H. St. John 18242* (US [US00947849]), vicinity of Nasinu, 21 Oct 1927, *J.W. Gillespie 3430* (US [US02700440]).

Burckella obovata (G.Forst.) Pierre — NEW GUINEA, Bougainville, 3 Oct 1969, *D.B. Foreman NGF 45744* (A [A02465185]); VANUATU, Tana, *Forster s.n.* (Holotype K [K000777927]), Tanna Island, trail to Mt Tukosmera, 468 m elev., 25 Jun 2014, *G.M. Plunkett 2912* (NY [NY02858997]), Vanua Lava Island, 100 m elev., 10 Jul 1928, *S.F. Kajewski 464* (NY [NY05057002]).

Burckella polymera P.Royen — NEW GUINEA, Northern District, South of Gona 2, Gona Native Land, 29 Mar 1960, *G. McDonald NGF 8242* (K [K005687348], L [L0106546]), Buna Hinterland, north of Embi Lakes, Mar 1945, *L.S. Smith NGF 1258* (Isotype A [A00961500]), Popondetta, 200 ft elev., 21 Sep 1966, *Womerseley & Jenkins NGF 24823* (A [A02465193]).

Burckella poolei H.J.Lam — MALUKU, Weda, Tilope, 4 May 1938, *NIFS bb.2911* (A [A02465195]), Sula Is., 21 Oct 1939, *NIFS bb. 29931* (L [L.2652079]), Aru Is., Kobroor, 29 Oct 1994, *H.P. Nooteboom 5968* (L [L.2652078]); NEW GUINEA, Papua, Vailala River, *Lane-Poole 323,* illus. of Type specimen (U [U.1596442]), Gulf Division, Aird Hills, 27 Jun 1955, *E. Gray & A.G. Floyd NGF 7195* (L [L.2652082]).

Burckella thurstonii (Hemsl.) H.J.Lam — FIJI, Aug 1894, *J.B. Thurston s.n.* (Holotype K [K000777919], Aug 1894, *J.B. Thurston s.n.* (K [K000777918]), Kalabu nursery, 20 May 1969, *E. Damanu & E.D. Tevita K220* (L [L.2652077]), above the Levuka reservoir, 500 m elev., 30 Jan 1928, *J.W. Gillespie 4516* (NY [NY5056980]).

Table 1. Diagnostic characters separating *Burckella coi* from similar species.

	B. coi	*B. poolei*	*B. obovata*	*B. polymera*	*B. fijiensis*	*B. thurstonii*
Growth habit; height, base	tree; 18–40 m; low rounded buttresses	tree; 33 m	tree; to 36 m; 2 m high plank buttresses	tree; to 28 m	tree; 5–25 m	tree; to 15 m
Stem diameter (cm)	28–97	up to 95	up to 100	unknown	*c.* 30	unknown
Petiole (cm)	4.5–10	2.0–3.5	2–4(–7.5)	1–4	1.5–8	1–3
Leaf lamina (cm)	obovate, (6–)12–25(–34) long, (3–)6–8(–11) wide	obovate-oblong, 12–30 long	obovate, 10–30(–40) long, 4.5–13 wide	obovate, 9–18 long, 4–8 wide	ovate, oblong or slightly obovate, 14–26 long, 6.7–9.2 wide	obovate, 16–21 long, 6–9 wide
Secondary nerves	(9–)11–15(–22)	19–22(–26)	(9–)11–13(–20)	17–25	20–25	15–17
Flowers	cream-coloured or yellowish white	not seen	cream-coloured or white	not seen	not seen	not seen
Pedicel (cm)	3–5.8(–6.5)	not seen	1–3	1–3	2.5–3.5	4.8

	B. coi	*B. poolei*	*B. obovata*	*B. polymera*	*B. fijiensis*	*B. thurstonii*
Calyx	single whorl of 4 sepals, the lobes imbricate, glabrous	not seen	pubescent, 0.3 cm long	not seen	not seen	pubescent
Stamens	40–48(–50)	25–30	(9–)12–16(–18)	25	up to 20	*c.* 40
Corolla lobes (mm long)	8, spatulate, 12.9–16.8	8, spatulate	8, 6–8	7–8	not seen	14
Corolla tube (mm long)	13.5–14.4	not seen	4	not seen	not seen	not seen
Ovary locules	8	4–5	4–6	7–8	4	4
Fruit	1-seeded, 4–5 × 3–3.5 cm; juvenile fruits occasionally shallowly furrowed	not seen	1-seeded; 10–12 cm long; furrowed pericarp	not seen	1-seeded; 6–8 cm wide at maturity	at least 5 cm diam.
Seed, seed scar	reddish-brown, glossy, with very narrow scar	not seen	seed scar almost half of the seed surface	not seen	seed scar wide, covering nearly half of the seed	not seen
Habitat, elevation	dense lowland forest on both ultramafic and normal soils, coastal up to 387 m	low elevation forest, up to 250 m	lowland forests, sometimes cultivated for its edible fruits	forests at low elevations	dense forest, near sea level up to 825 m	forests, 150–300 m elevation
Geographic distribution	Philippines (Luzon Island)	Maluku (Sula and Aru Islands), New Guinea	Maluku, New Guinea, Vanuatu, Bismarck Archipelago, Solomon Islands	New Guinea	Fiji	Fiji
References	this study	Lam and Van Royen 1952; Lemmens and Sudo 1995	Lam 1942; Lam and Van Royen 1952; Smith 1981; Lemmens and Sudo 1995	Lam and Van Royen 1952; Van Royen 1957	Lam and Van Royen 1952; Smith 1981	Lam 1942; Lam and Van Royen 1952; Smith 1981

Taxonomy

Burckella coi Fernando, *sp. nov.*

Type: PHILIPPINES: Luzon Island, Isabela Prov., Dinapigue, 387 m elevation, in dense, tall forest on ultramafic soil, flower buds and open flowers, 7 April 2025, *E.S. Fernando 6411* (holotype: PNH; isotypes: LBC + spirit coll., SING). Figure 1.

Diagnosis: *Burckella coi* is similar to a small group of species in the genus in the following characters: large tree growth habit with obovate leaves of 10 up to 30 cm long with many (15–30) secondary nerves, and large number of stamens (25–40). This group includes *B. poolei* (Maluku and New Guinea), *B. obovata* (Maluku to Solomon Islands), *B. polymera* (New Guinea), *B. fijiensis* (Fiji), and *B. thurstonii* (Fiji). *B. coi,* however, differs in having 40–50 stamens in two rows (vs 30 in two rows in *B. poolei,* 25 in *B. polymera,* 20 or less in *B. fijiensis*, and only 12–16 in *B. obovata*). *B. thurstonii* also has c. 40 stamens, but in this species the calyx is densely pubescent and with larger fruits (5 cm diameter) compared to *B. coi* with generally glabrescent calyx and smaller fruits (3 cm diameter). *B. coi* also has a very distinctive narrow seed scar of only about 11% of the total circumference of the seed (vs seed scar wide, covering nearly half of the seed in *B. obovata* and *B. fijiensis;* seed is not known in *B. polymera*, *B. poolei,* and *B. thurstonii*).

Tree with monopodial trunk, *c.* 18–40 m tall, often reaching and protruding through the forest canopy; trunk to *c.* 28–97 cm diameter, sometimes with low, rather broad and rounded buttresses; outer bark finely fissured-scaly, with copious sticky, white sap when cut. *Branches* with sympodial growth of *Terminalia*-type branching, the leaves densely clustered at ends of branchlets; the *branchlets,* including parts with and without nodes, to *c.* 50–69 cm long, rather thick, (0.7–)1.6–2.8(–4) cm diameter, thicker in distal parts with nodes. *Leaves* simple, spirally and densely clustered at ends of branchlets; petiole (4.5–)7.2–8.5(–10) cm long, 2–3 mm thick, generally thicker towards the base near point of attachment with the stem, terete, more or less furrowed on adaxial side, convex on abaxial side; lamina on adaxial surface, glossy green (*in vivo,* light- to dark-brown *in sicco*), glabrous; lamina on abaxial surface of young leaves with golden-brown indumentum, soon glabrescent, pinnately nerved; base attenuate; apex obtuse, the very tip sometimes shortly curved downwards; lamina coriaceous, obovate (6–)12–25(–34) cm long, (3–)6–8(–11) cm wide; the midrib rather depressed and furrowed on adaxial surface, very prominent on abaxial side; secondary nerves visible on both sides of the lamina, (9–)11–15(–22) on each side of the midrib, ascending at an angle of (40–)60(–80)° from the midrib, arching and joined near the slightly thickened margin; stipules subulate,

Figure 1. *Burckella coi* Fernando (Holotype; *E.S. Fernando 6411,* PNH). Photograph by E.S. Fernando and J.J.P. Latayan.

10–18 mm long, 1.7–2.3 mm near the base. *Flowers* pseudo-terminal on the branchlets, ± fasciculate, up to 8–17 flowers per branchlet; buds and open flowers pendulous from their attachment on the tips of branchlets; flower bud ovoid; pedicel 3–5.8(–6.5) cm long, 1.4–3.7 mm thick, finely glabrescent; style exserted up to 1.4 cm from tip of corolla. *Calyx* a single whorl of 4 sepals, the lobes imbricate, with the margins of 2 sepals inside and the other 2 outside, connate at the base, outer lobes broadly ovate, 7.1–10.1 mm long, 8.8–12.3 mm wide, inner lobes ovate 8.8–10.1 mm long, 7.2–8.1 mm wide. *Corolla* exserted, corolla tube cupuliform, 13.5–14.4 mm long, 12.7–13.9 mm wide at the top, narrower at the base, appressed short-hairy on the outer surface; corolla lobes 8, imbricate, cream-coloured or yellowish-white, spatulate, 12.9–16.8 mm long, 9.8–13.5 mm wide, glabrous, the apices obtuse; corolla lobe margins entire, sometimes fimbriate near the base. *Stamens* (40–)42–48(–50), at least 3–6(–8) stamens inserted at the base of each corolla lobe; filaments 5–9 mm long, 0.9–1.2 mm wide, very densely hairy; anthers basifixed, lanceolate, 4.5–7.5 mm long, 1 mm wide, light yellow, then turning brown. *Ovary* ± oblate in shape, 10 mm wide near the base narrower towards the style, 3.5 mm high, glabrous, with 8 distinct locules. *Fruit* a fleshy, 1-seeded berry, broadly ellipsoid, very rarely subglobose, 4–5 cm long, 3–3.5 cm wide, green, ripening light to dark purple; the persistent style positioned asymmetrically at fruit apex; juvenile fruits with epicarp glossy green, covered with brownish indumentum towards the base, soon glabrescent, epicarp sometimes with shallow longitudinal furrows; pericarp fleshy, up to 3–5 mm thick on adaxial side, 10 mm thick on abaxial side. *Seed* ellipsoid, laterally compressed, glossy reddish-brown, 28–35 mm long × 12–14 mm wide × 7–9 mm thick; hilum apical; seed scar adaxial, very narrow, covering c. 87–94% of the length of the seed, but only *c.* (6–)11(–14)% of the seed circumference. *Seedling* epigeal, phanerocotylar; hypocotyl reddish, terete, 85–142 mm long, 2–2.8 mm wide near the base, tapering distally; epicotyl light-green, 8.7–30 mm long, 1.7–2.5 mm wide, very finely short-hairy; cotyledons dark green, plano-convex, 22–30 mm long, 7–12 mm wide, 2.4–3.9 mm thick, dark green when fully expanded; first two eophylls opposite, ovate-elliptic, 71–114 mm long, 32–45 mm wide, base obtuse, apex acute to acuminate, the secondary nerves 10–12 on each side of the midrib, prominent on both sides of the lamina; subsequent leaves alternate or spiral. Figures 2–6.

Geographical distribution: Endemic to the Philippines. *Burckella coi* is, thus far, known only from Palanan, Divilacan (Aubarede Peninsula), and Dinapigue, all in Isabela Province on the northeastern section of Luzon Island. The Palanan locality is on a non-limestone and non-ultramafic substrate. Here the ophiolite, with basalt and gabbros, has limited exposures along the coastlines (Andal *et al.* 2005). The Divilacan and Dinapigue localities are both on ultramafic substrates. Much of the area here is part of the Isabela ophiolite (Andal *et al.* 2005; Morishita *et al.* 2006), the northernmost end of the ophiolitic belts along the eastern coast of the Philippine archipelago (Andal *et al.* 2005). Ophiolites and ophiolitic complexes are suites of ultramafic rocks interpreted as remnants of ancient oceanic crust and upper mantle that have been uplifted tectonically (and emplaced into larger islands) and contain various types of mineral deposits (Dilek and Furnes 2014), including nickel which is often hosted in lateritic soil with weathering of the rocks (Yumul *et al.* 2003).

Etymology: This species is named in honour of the late Leonardo L. Co, Filipino field botanist and a dear friend and colleague, who collected the first specimen of this species in Isabela in May 1991. The discovery of this genus in the Philippines is, indeed, both surprising and extraordinary for one not previously known anywhere west of the Wallace Line.

Habitat and ecology: *Burckella coi* occurs in dense forests on both ultramafic and non-ultramafic soils, from near the seacoast up to about 387 m elevation. In Dinapigue, it tends to prefer slopes and valley bottoms in the forest together with *Terminalia darlingii* Merr. (Combretaceae), smaller trees of *Palaquium tenuipetiolatum* Merr. (Sapotaceae), *Astronia ferruginea* Elmer (Melastomataceae), and *Pinanga urosperma* Becc. (Arecaceae), among many others. The largest tree of this new species that we found in the Dinapigue area was at about 120 m elevation near the bottom of a narrow valley and was estimated at more than 40 meters tall protruding through the canopy and with trunk diameter measured at 85 cm dbh.

Other specimens examined: PHILIPPINES. Luzon Island, Isabela Prov., Divilacan, Aubarede Peninsula, coastal ultramafic site, juvenile fruits, 22 May 1992, *L.L. Co 3622* and *3623* (PUH); Palanan, San Isidro, lowland dipterocarp forest, *c.* 20 m elevation, juvenile fruits, 21 May 1991, *L.L. Co 3530* (A); Dinapigue, dense forest on ultramafic soil, 387 m elevation, juvenile fruits, 23 May 2024, *E.S. Fernando 6015* (LBC, PNH, SING), 130 m elevation, on steep slope, flower buds, 8 April 2025, *E.S. Fernando 6426* (LBC, PNH, PUH), 330 m elevation, on valley bottom, fruits, seeds, and seedlings, 1 July 2025, *E.S. Fernando 6511* (LBC).

Notes: The study by Richardson *et al.* (2014) showed that the Tribe Isonandreae are derived from an African grade and diversified first in Sundania (mainly Laurasia), then migrated eastwards. According to Richardson *et al.* (2014), many of the west–to–east migrations across the Wallace Line were accompanied by extensive radiation in the east (*e.g.* Muellner *et al.* 2008; Su and Saunders 2009; Thomas *et al.* 2012), exemplified in Sapotaceae by *Palaquium* with about half its 110 species occurring to the east of the Wallace Line; *Payena* has at least one of its 20 species to the east of the line. This west–to–east migration of *Palaquium* and related genera was also confirmed in the recent work of Phang *et al.* (2025b). Until the discovery of this new species in the Philippines, the entire genus *Burckella* (13 species) was only known from east of the Wallace Line (Maluku to Tonga). Could this new Philippine species of *Burckella* be part of what Richardson *et al.* (2014, p. 138) referred to as 'the sister lineage of extant *Burckella*' that 'may now be extinct'? Or could it be the result of a rare 'back-migration from east to west' of the Wallace Line (Richardson *et al.* 2014, p. 138)? A molecular study on the relationships of *Burckella coi* with other species in the genus east of the Wallace Line would likely reveal further interesting information about the evolution and dispersal of the genus in the West Pacific.

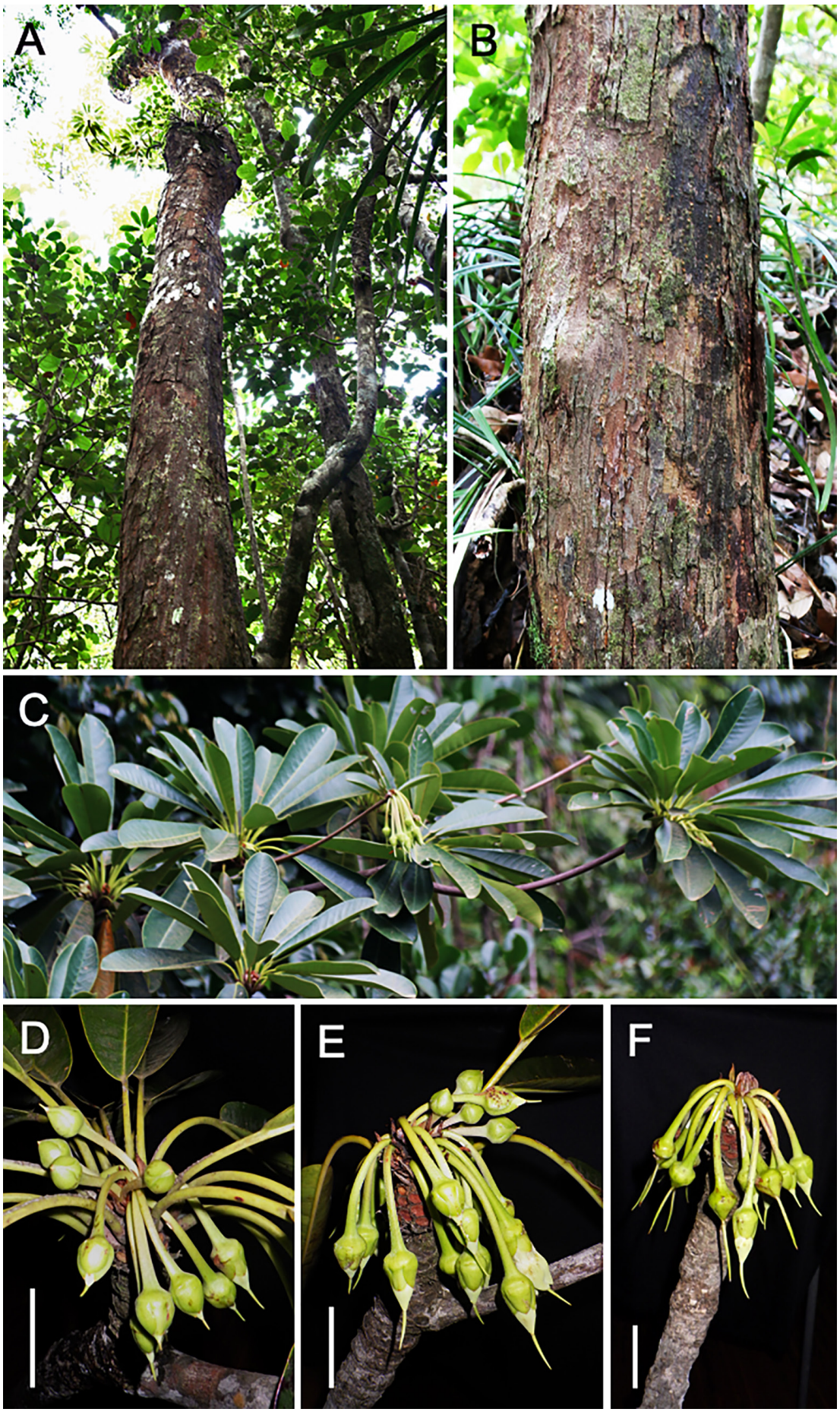

Figure 2. *Burckella coi* Fernando. **A**. Tree growth habit **B**. Trunk showing finely fissured scaly outer bark. **C**. Part of branch showing *Terminalia*-type branching with densely clustered leaves. **D**, **E**. Leafy tips of branchlets with flower buds. **F**. Tip of ultimate, leafless branchlet with flower buds. A–B, D–E from *E.S. Fernando 6411*; C from *E.S. Fernando 6426.* Scale bars: D–F = 3 cm. Photographs by Edwino S. Fernando.

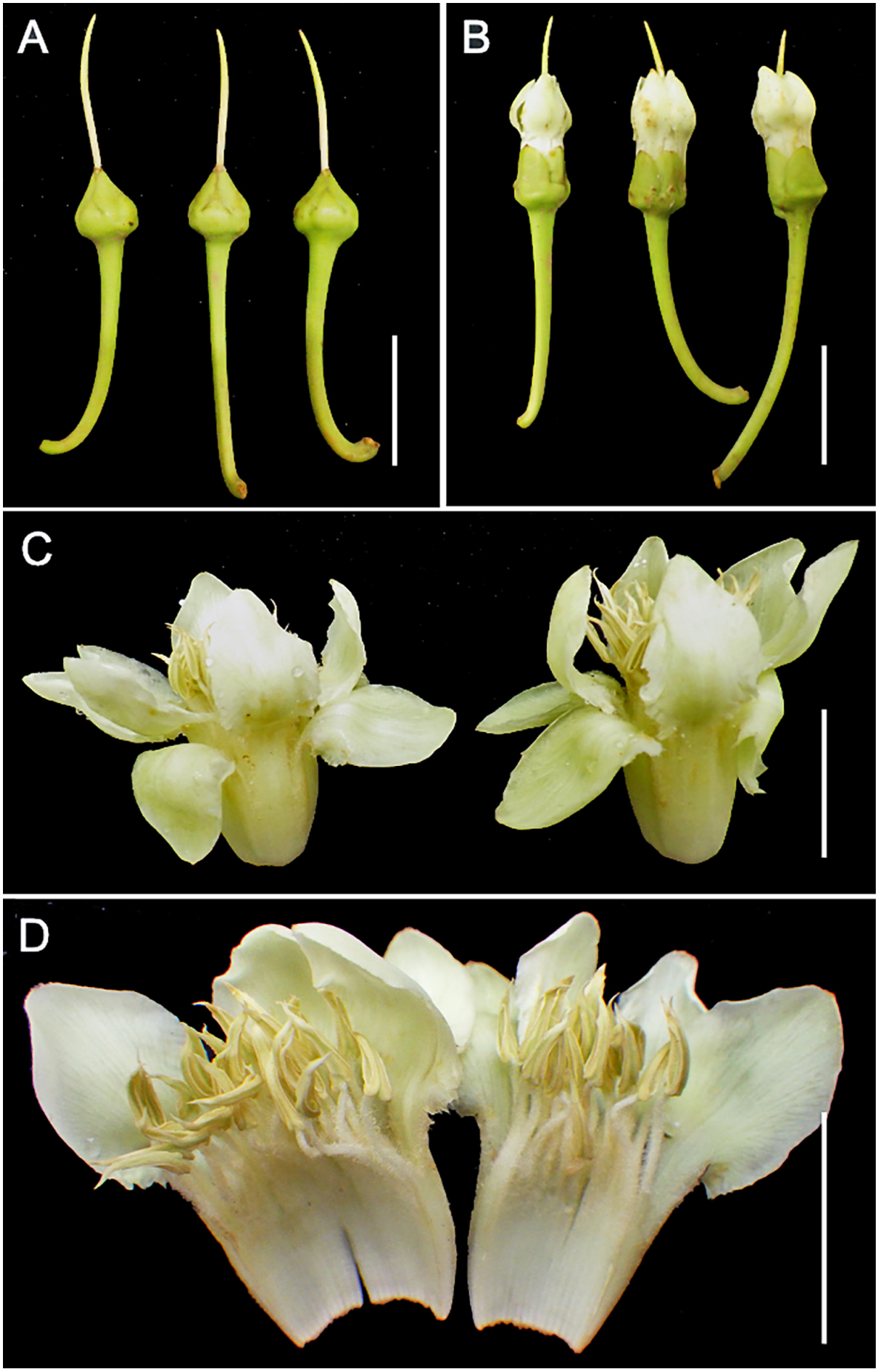

Figure 3. *Burckella coi* Fernando. **A**. Flower buds showing exserted styles. **B**. Flowers with corolla lobes just emerging. **C**. Corolla, each with eight lobes. **D**. Inner side of corolla showing the stamens with hairy filaments. A–D from *E.S. Fernando 6411*. Scale bars: A–B = 30 mm; C–D = 20 mm. Photographs by Edwino S. Fernando.

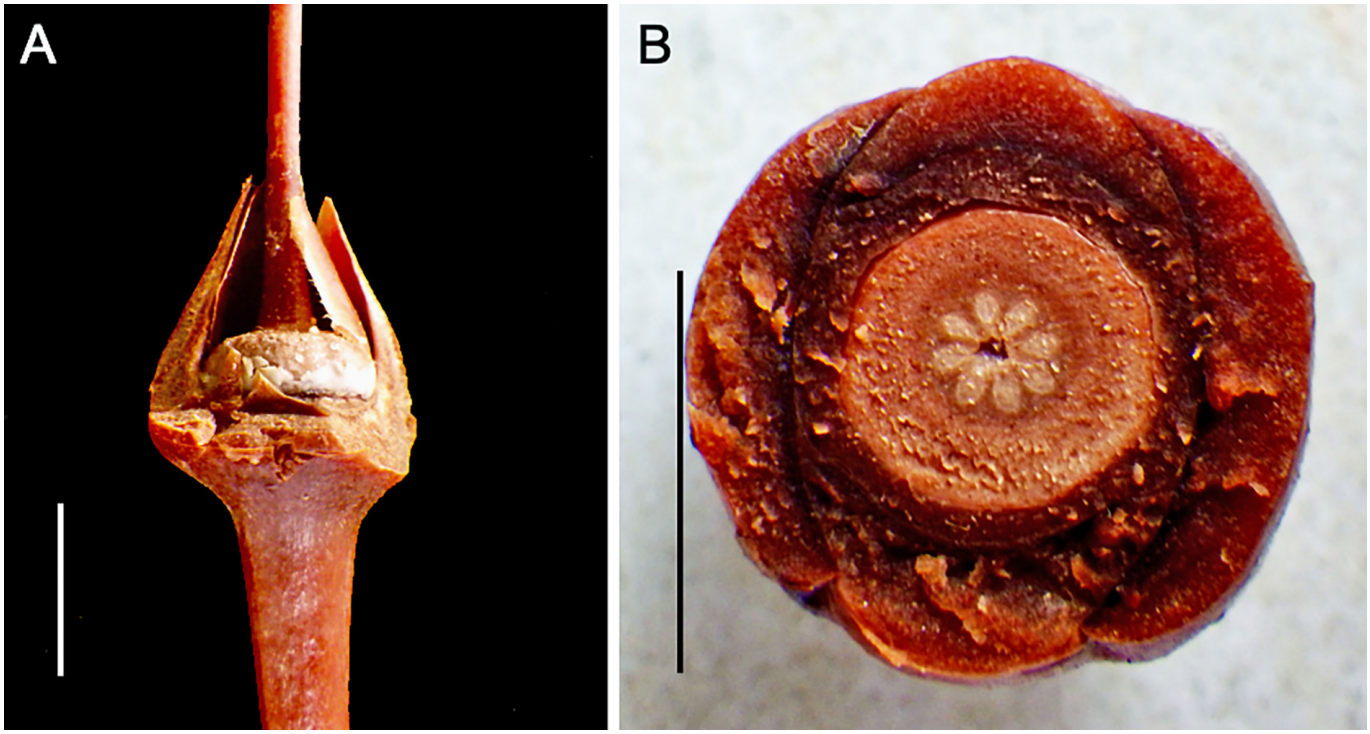

Figure 4. *Burckella coi* Fernando. **A.** Flower bud with some of the sepals and developing corolla lobes removed to show ovary shape. **B.** Transverse section of ovary from flower bud showing 8 locules. A–B from *E.S. Fernando 6411,* material in spirit collection. Scale bars: A–B = 10 mm. Photographs by Edwino S. Fernando.

In the wild, *Burckella coi* looks very similar in physiognomy, growth architecture, branching, and leaf arrangement to the Philippine endemic and ultramafic obligate *Terminalia darlingii* Merr. (Combretaceae) which is frequent in the same area. The latter, however, is a much shorter and smaller-diameter tree, with generally smaller leaves and smaller flowers and winged fruits in pendulous racemes emerging from among the leaves.

Provisional conservation assessment: All specimen collections of *Burckella coi* cited here are only from three sites *i.e.,* Divilacan (Aubarede Peninsula), Palanan, and Dinapigue, all in Isabela Province. Those in Dinapigue were all from just within 2–5 km of each other, between 120 and 390 m elevation. The record for Aubarede Peninsula (approximately 80 km north of the Dinapigue site) is based on two specimens collected from a single locality on a coastal ultramafic site. This population in Divilacan and the one in Palanan are within the Northern Sierra Madre Natural Park, the largest protected area in the Philippines covering 3594.86 km^2. That in Dinapigue is outside the protected area and currently within a concession for a mining project. Using the online GeoCAT conservation assessment tool (Bachman *et al.* 2011; http://geocat.iucnredlist.org), we calculated an Extent of Occurrence (EOO) of only 344.17 km^2 which is well within the threshold for the category of Endangered (EN), and Area of Occupancy (AOO) of just 24 km^2, also within the threshold for the EN category. Some of the forested areas between the three currently known sites that are within the Northern Sierra Madre Natural Park, including Divilacan and Palanan, could harbor mature individuals and populations of *Burckella coi*. It is the population of this species in Dinapigue outside of the natural park area that may be at risk. Overall, the population of this new species is severely fragmented and, thus far, known and documented only from six locations. A continuing decline is inferred or projected in the (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat due to the possibility of mining and other development activities on site; and (iv) number of mature individuals. Following IUCN (2012) and the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN Standards and Petitions Subcommittee 2019), we preliminarily assess *Burckella coi* as Endangered [EN B2ab(i,ii,iii,iv)].

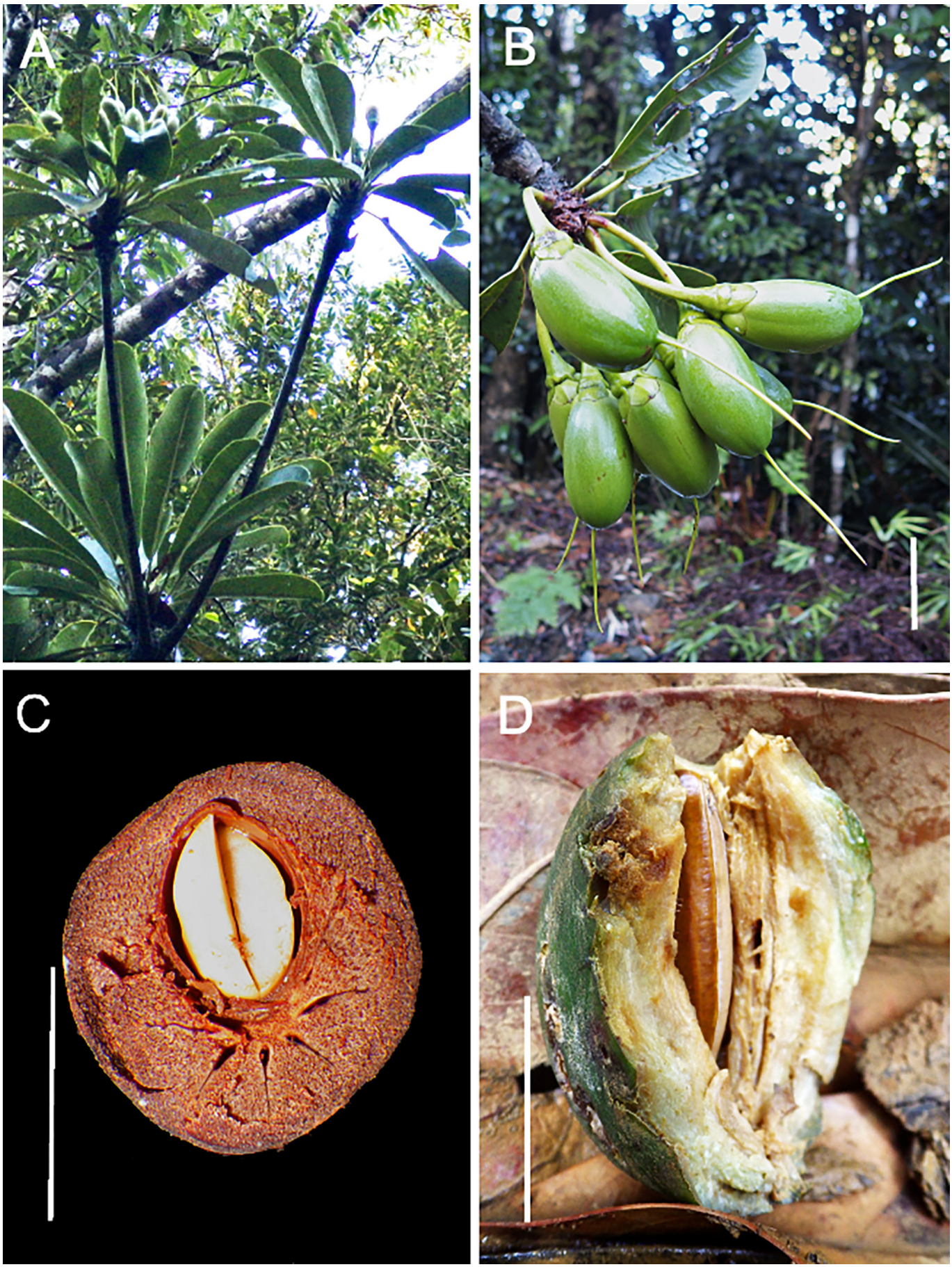

Figure 5. *Burckella coi* Fernando. **A**. Branch in the tree crown with fruits showing densely clustered leaves. **B**. Immature fruits showing persistent styles. **C**. Transverse section of immature fruit (from material in spirit collection) showing single seed. **D**. Mature fruit partially eaten by bats showing light-brown seed with narrow scar. A–C from *E.S. Fernando 6015*; D from *E.S. Fernando 6511*. Scale bars: B = 25 mm; C–D = 20 mm. Photographs by Edwino S. Fernando.

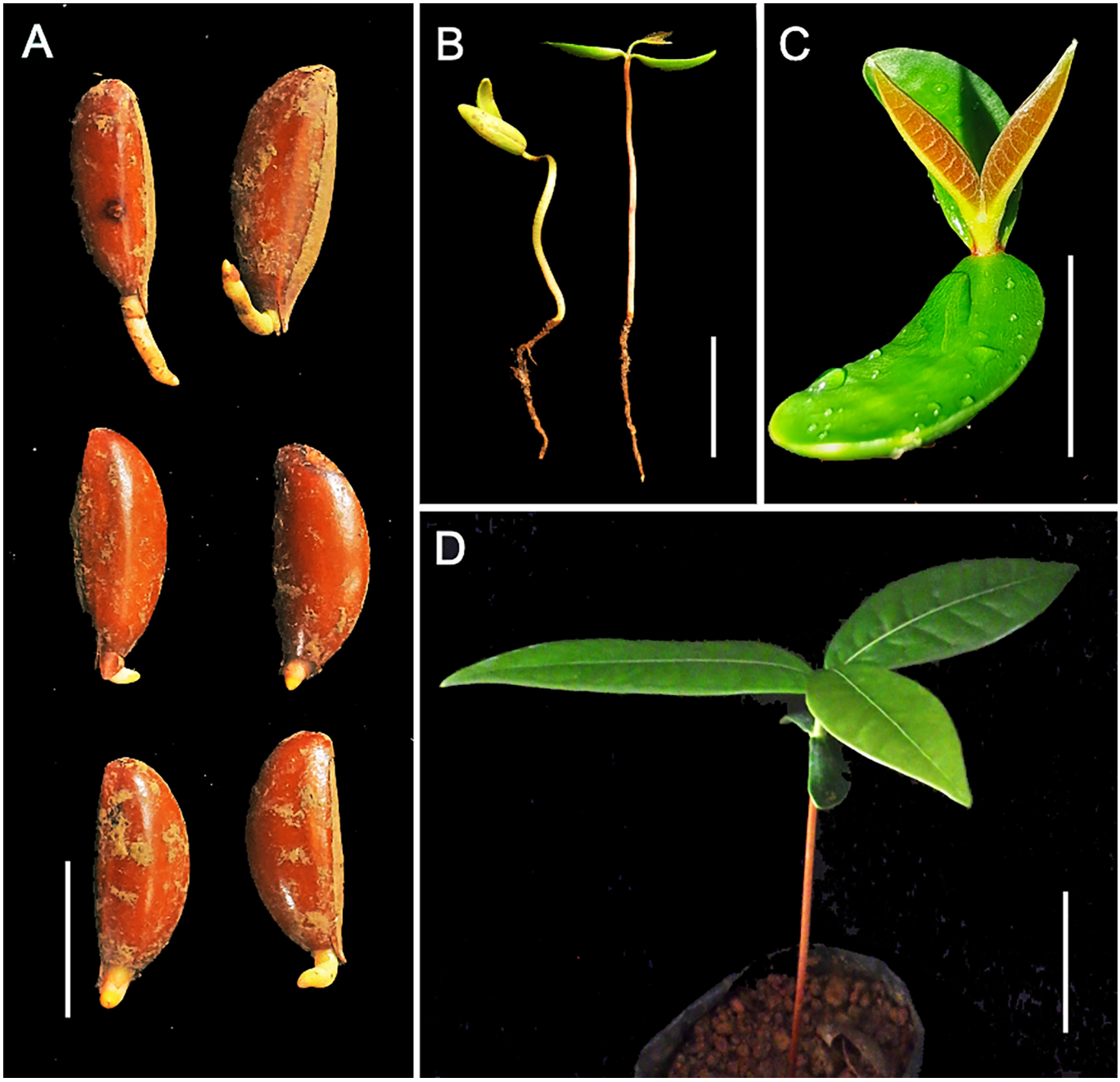

Figure 6. *Burckella coi* Fernando. **A**. Germinated seeds showing the emergence of the radicle, the glossy seed surface, and the narrow seed scar. **B**. Seedlings showing epigeal and phanerocotylar germination type, the exposed cotyledons are plano-convex, becoming green when fully expanded, and prominent long hypocotyl. **C**. Green, expanded cotyledons and oppositely arranged newly developing eophylls. **D**. Two-month-old seedling with first two fully expanded eophylls, first leaf, long distinctly reddish hypocotyl, and short epicotyl. All germinated seeds (A) and seedlings (B) were directly collected from the wild beneath the parent tree; (C) and (D) were seedlings grown in nursery from seeds in (A). A–B from *E.S. Fernando 6511*. Scale bars: A = 10 mm; B = 5 cm; C = 20 mm; D = 30 mm. Photographs by Edwino S. Fernando.

Acknowledgements

We are grateful to Nickel Asia Corporation and Dinapigue Mining Corporation for allowing ESF and MOQ access to their mining concession for plant biodiversity study. Permission to collect specimens from within the mining area for further scientific study was covered by Gratuitous Permits Nos. 328 and 343 issued by the Biodiversity Management Bureau, Department of Environment and Natural Resources (DENR) of the Philippines. We especially thank Freddie Donato, Edwin O. Breganza, and Jasper O. Retiro for assistance with the field work, Lorie Joy E. Matute for work with the nursery activities, processing of herbarium specimens and data gathering, and Jay S. Fidelino for help with the Figures.

References

Andal ES, Arai S, Yumul GP Jr (2005) Complete mantle section of a slow-spreading ridge-derived ophiolite: An example from the Isabela ophiolite in the Philippines. *Island Arc* 14: 272–294. DOI

Bachman S, Moat J, Hill AW, de la Torre J, Scott B (2011) Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *ZooKeys* 150: 117–126. DOI

Beentje H (2016) *The Kew Plant Glossary*. 2nd edition. (Kew Publishing, Richmond, UK)

Briggs M, Utteridge TMA, Swenson U (2021) Sapotaceae Juss. (Ericales). *In* Utteridge TMA, Jennings LVS (eds), *Trees of New Guinea*. pp. 476–487. (Kew Publishing, Richmond, UK)

De Vogel EF (1980) *Seedlings of Dicotyledons: Structure, Development, Types*. 465p. (Centre for Agricultural Publishing and Documentation, Wageningen, Netherlands)

Dilek Y, Furnes H (2014) Ophiolites and their origins. *Elements* 10: 93–100. DOI

Duke JA (1969) On tropical tree seedlings I. Seeds, seedlings, systems, and systematics. *Annals of the Missouri Botanical Garden* 56(2): 125–161. DOI

Fernando ES, Quimado MO (2023) *Ultramafic Flora of the Philippines: An Introduction to the Seed Plant Diversity on Philippine Ultramafics*. (University of the Philippines: Los Baños) URL

Fernando ES, Quimado MO, Quakenbush JP (2025) *Medinilla saxa* (Melastomataceae: Sonerileae), a new, ultramafic rock-dwelling species from the Philippines. *Phytotaxa* 718(2): 144–152. DOI

Gautier L, Naciri Y, Anderberg AA, Smedmark JEE, Randrianaivo R, Swenson U (2013) A new species, genus and tribe of Sapotaceae, endemic to Madagascar. *Taxon* 65(2): 972–983. DOI

IUCN (2012) *IUCN Red List Categories and Criteria*. Version 3.1, 2nd ed. (IUCN: Gland and Cambridge)

IUCN Standards and Petitions Subcommittee (2022) *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 15.1. Prepared by the Standards and Petitions Subcommittee. PDF

Lam HJ (1932) Enumeration of the Sapotaceae, thus far known from New Guinea. *Nova Guinea (Botanique)* 14: 549–570.

Lam HJ (1942) A tentative list of the wild Pacific Sapotaceae, except those from New Caledonia. *Blumea* 5(1): 1–45. PDF

Lam HJ, Van Royen P (1952) II. *Burckella* Pierre. *Blumea* 6(3): 580–593. PDF

Lemmens RHMJ, Sudo S (1995) *Burckella* Pierre. *In* Lemmens RHMJ, Soerianegara I, Wong WC (eds.), *Plant Resources of South-East Asia* No. 50(2), Timber trees: Minor commercial timbers. pp. 88–92. (PROSEA, Bogor, Indonesia) URL

Morishita T, Andal ES, Arai S, Ishida Y (2006) Podiform chromitites in the lherzolite-dominant mantle section of the Isabela ophiolite, the Philippines. *Island Arc* 15: 84–101. DOI

Muellner AN, Pannell CM, Coleman A, Chase MW (2008) The origin and evolution of Indomalesian, Australasian and Pacific island biotas: insights from Aglaieae (Meliaceae, Sapindales). *Journal of Biogeography* 35: 1769–1789. DOI

Pelser PB, Barcelona JF, Nickrent DL (eds.) (2011 onwards) *Co's Digital Flora of the Philippines*. URL. [Accessed 25 Nov 2025]

Pennington TD (1991) *The Genera of Sapotaceae*. (Royal Botanic Gardens, Kew, UK)

Phang A, Middleton DJ, Wilkie P (2025a) Transfer of the genus *Aulandra* into *Palaquium* (Sapotaceae) and associated nomenclatural changes. *Edinburgh Journal of Botany* 82: 2063, 1–10. DOI

Phang A, Niissalo MA, Herrera-Alsina L, Pezzini FF, Hollands R, Burslem DFRP, Ruhsam M, Middleton DJ, Wilkie P, Khew GS (2025b) Novel phylogeographic insights into *Palaquium* and the tribe Isonandreae (Sapotaceae). *Molecular Phylogenetics and Evolution* 212: 108403. DOI

POWO (2025) *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet. URL. [Retrieved 25 Nov 2025]

Richardson JE, Bakar AM, Tosh J, Armstrong K, Smedmark J, Anderberg AE, Slik F, Wilkie P (2014) The influence of tectonics, sea-level changes and dispersal on migration and diversification of Isonandreae (Sapotaceae). *Botanical Journal of the Linnean Society* 174(1): 130–140. DOI

Smith AC (1981) *Flora Vitiensis Nova, A New Flora of Fiji (Spermatophytes Only)*. Vol. 2, pp. 766–772. (Pacific Tropical Botanical Garden, Hawaii, USA) URL

Smith AC, Darwin SP (1975) Studies of Pacific Island plants, XXXI. Notes on Fijian Sapotaceae. *Brittonia* 27: 165–171. DOI

Su YCF, Saunders RMK (2009) Evolutionary divergence times in the Annonaceae: evidence of a late Miocene origin of *Pseuduvaria* in Sundania with subsequent diversification in New Guinea. *BMC Evolutionary Biology* 9: 153. DOI

Thiers B (2025) (continuously updated). *Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff*. New York Botanical Garden's Virtual Herbarium. Available from: URL [accessed 26 August 2025].

Thomas DC, Hughes M, Phutthai T, Ardi WH, Rajbhandary S, Rubite R, Twyford AD, Richardson JE (2012) West to east dispersal and subsequent rapid diversification of the mega-diverse genus *Begonia* (Begoniaceae) in the Malesian archipelago. *Journal of Biogeography* 39: 98–113. DOI

Van Royen P (1957) Revision of the Sapotaceae of the Malaysian area in a wider sense. IIa. Additional notes on *Burckella* Pierre. *Blumea* 8(2): 201–203. PDF

Van Royen P (1967) Notes on the systematy of Solomon Islands' plants and some of their New Guinea relatives, X. *Gardens' Bulletin Singapore* 22: 33–39. URL

Yumul GP Jr, Dimalanta CB, Maglambayan VB, Tamayo RA Jr (2003) Mineralization controls in island arc settings: Insight from Philippine metallic deposits. *Gondwana Research* 6(4): 767–776. DOI