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TAXONOMIC REVISION OF *CAUSONIS* (VITACEAE) IN NEW GUINEA

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The three species of *Causonis* (Vitaceae) that occur on the island of New Guinea, namely *C. australasica*, *C. maritima* and *C. trifolia*, are here revised. We provide synonymy, descriptions, a distribution map and diagnostic character illustrations.

Keywords. *Causonis*, New Guinea, taxonomy, Vitaceae.
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Introduction

The grape family (Vitaceae) has been the focus of extensive research over the years due to its great economic importance and its phylogenetic and biogeographical patterns (Rabarijaona *et al.*, 2020). The family has been found to contain five clades (*Ampelopsis sensu lato*, *Ampelocissus–Vitis*, *Parthenocissus–Yua*, *Cissus*, and *Cayratia–Cyphostemma–Tetrastigma*), and to maintain the monophyly of the genera, several genera have been segregated (Wen *et al.*, 2018).

The genus *Cayratia* Juss. *sensu lato* has consistently been found to be paraphyletic (Wen *et al.*, 2007; Trias-Blasi *et al.*, 2012; Lu *et al.*, 2013; Parmar *et al.*, 2021). To maintain the monophyly within Vitaceae, the species in *Cayratia* sect. *Discypharia* Suess. (Suessenguth, 1953; Latiff, 1981) were placed in the newly reinstated genus *Causonis* Raf. (Wen *et al.*, 2013). This genus can be separated from the *Cayratia sensu stricto* by the lack of a distinct membrane enclosing the ventral infolds in seeds (Wen *et al.*, 2013; Parmar *et al.*, 2021). Both *Cayratia* and *Causonis* can be distinguished from other Vitaceae genera by being hermaphroditic plants with 4-merous flowers, and mostly axillary but sometimes pseudo-axillary inflorescences.

Causonis contains 17 species and four varieties widely distributed in the tropical, subtropical and temperate regions from Asia to Australia (Parmar *et al.*, 2021; Trias-Blasi *et al.*, 2021). In New Guinea, the genus *Causonis* contains three species: *C. australasica* L.M.Lu & Jackes, *C. maritima* (Jackes) Jackes and *C. trifolia* (L.) Mabb. & J.Wen. During research into the genus, a specimen identified as *Causonis timoriensis* (DC.) L.M.Lu & V.C.Dang was found, but its identity could not be confirmed because of the lack of seeds (an important character for the genus). Because this species occurs in Timor-Leste, there

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is a possibility that it may also exist in New Guinea, because the islands are relatively close geographically. The species *Causonis japonica* (Thunb.) Raf. is widespread in temperate and tropical regions, therefore it probably also occurs in New Guinea. However, all the specimens examined labelled as *Causonis japonica* have been identified as the morphologically similar *C. australasica* here. Although *Causonis japonica* is not formally recorded from New Guinea, we have added it to the key to aid identification if found. Additionally, we found that most specimens named *Causonis trifolia* in the BO, K and L herbaria are *C. maritima*.

Recent phylogenetic research on the genus (Parmar *et al.*, 2021) confirms the species status of the three New Guinea *Causonis*. However, morphological characters that separate *Causonis australasica*, *C. japonica*, *C. maritima* and *C. trifolia* are difficult to distinguish in herbarium specimens, particularly those without seeds. The shape of the endosperm in cross-section and the length of the chalaza in comparison with the total seed length are important for identification (see **Figure 2**C–H). Therefore, although we have examined a large number of specimens during our revision, we have used only those containing seeds for the species revised here. Even with the reduced number of specimens used, we here present additional distribution data than previously reported for New Guinea (Jackes, 1987; Parmar *et al.*, 2021).

Materials and methods

This study is based on herbarium materials deposited at BO, K and L and online images from A, BRI, CANB, P and US (herbarium codes according to Thiers, continuously updated). Morphological characters were studied using a hand lens (30–60 × magnification) and stereomicroscope. Protologues and other taxonomic literature were also studied.

The descriptions follow the style and level of detail outlined in Trias-Blasi & Parnell (2020), and the general terminology is based on Beentje (2016). The conservation assessments are based on the most recent version of the guidelines of the IUCN Standards and Petitions Subcommittee (IUCN, 2012), and the extent of occurrence (EOO) and area of occupancy (AOO) were calculated using the online tool GeoCAT (Bachman *et al.*, 2011), based on a 2 km by 2 km grid cell. In the lists of *Additional specimens examined*, the specimens from Papua New Guinea are listed first alphabetically by province and then alphabetically by collector. In cases of more than one collection by an author, these are listed in order of collection number.

Taxonomic treatment

Genus description

Causonis Raf., Raf., Med. Fl. 2: 122 (1830). – Type species: *Causonis japonica* (Thunb.) Raf.

Cayratia Juss. in Cuvier, Dict. Sci. Nat., ed. 2, 10: 103 (1818), *nom. cons. pro parte*. – Type species: *Cayratia pedata* (Lam.) Juss. ex Gagnep.

Columella Lour., Fl. Cochinch. 1: 85 (1790), *pro parte.* not *Columella* Vahl nor *Columella* Vell. – Type species: *Columella pedata* Lour.

Climbers, herbaceous; hermaphrodite; sometimes tuberous roots present; branchlets terete, with distinct longitudinal ridges; tendrils opposite to leaves, (1–)2–3(–8)-furcate, each branch subtended by a bract. *Leaves* alternate, pedately (4–)5(–7)-foliolate or trifoliolate; stipules 2, caducous; leaflets usually serrate at margin. *Inflorescence* a large compound dichasium, leaf-opposed or pseudoaxillary, rarely axillary. *Flowers* 4-merous; calyx cupuliform; corolla apex cucullate, valvate in aestivation; stamens inserted on the receptacle at the base of the floral disc, opposite to petals, filaments erect, anthers introrse; floral disc cupular and surrounding the ovary, 4-lobed; style conical, stigma minute and undivided. *Fruit* a berry, usually globose to oblate, purplish black when mature, 1- to 4-seeded. *Seeds* triangular, triangular-obovoid or obovoid-elliptic in dorsiventral view, smooth or somewhat angular, convex on the back; beak usually more or less cylindrical; chalaza linear and protruding on surface extending c.1/2 to 2/3 of seed length from apex; raphal ridge distinct; without a distinct membrane covering the ventral infolds, ventral infolds inconspicuous or keel-shaped, cup-shaped or suborbicular in ventral view, horseshoe-shaped or concave in cross-section; endosperm ruminate, T- or m-shaped in cross-section. 2n = 30, 40, 60, 80, 120.

Key to New Guinea species (including Causonia japonica *and* C. timoriensis*)*

1a. Tendrils 4- or 5-furcate; mature tendrils usually forming adhesive discs at the tips **3. *Causonis trifolia***

1b. Tendrils 2- or 3-furcate; tendrils lacking adhesive discs at the tips _____ 2

2a. Leaflets 3-foliolate _____ 3

2b. Leaflets pedately 5-foliolate _____ 4

3a. Veins conspicuously raised on abaxial side of the leaf; ventral folds inconspicuous in ventral side of seeds _____ *Causonis timoriensis*

3b. Veins inconspicuous on abaxial side of the leaf; ventral folds conspicuous in ventral side of seeds _____ **2. *Causonis maritima***

4a. Floral disc yellow, red, orange or pinkish at anthesis; endosperm m-shaped in cross-section; chalaza 2/3 of the seed length _____ *Causonis japonica*

4b. Floral disc lime green at anthesis; endosperm nearly T-shaped in cross-section; chalaza 1/2 of the seed length _____ **1. *Causonis australasica***

Species descriptions

1. Causonis australasica L.M.Lu & Jackes, Taxon 70(6): 1203 (2021). – Type: Australia, Queensland, State Forest Reserve 755, Barong logging area, 17°31'S, 145°50'E, 80 m, 13 vii 1977, *Gray* 620 (holotype CNS [barcode QRS009328!]; isotypes BRI [barcode BRI-AQ0542035!], CANB [barcode CANB514891!], CNS [barcode QRS009327!], JCT [barcode JCT-S4021!]). Image in Parmar *et al.* (2021: figure 7).

Herbaceous climber. *Stem* terete, with longitudinal ridges, branched, often reddish when young, hairs mainly at nodes; tendrils 2- or 3-furcate, without adhesive discs at tips. *Leaves* compound, pedately 5-foliolate, alternate, stipules triangular, 2–3(–5) × 1–1.5 mm, caducous; petiole 2.6–9.2 cm, central petiolule 1.1–3.5 cm long, lateral petiolules 0.3–1.8 cm long; central leaflet broadly lanceolate-ovate, elliptic, 5.2–11 × 2.6–5.7 cm, base rounded or cuneate, upper laterals lanceolate-ovate, elliptic, 2.9–10.8 × 1.9–4.8 cm, base asymmetrical or cuneate; lower laterals lanceolate-ovate, elliptic, 1.7–8 × 0.8–4.2 cm, base asymmetrical or cuneate; apex acuminate, caudate or cuspidate, margin serrate with 5–11 teeth one each side, sometimes sharply serrate, lateral veins 5–9 pairs, pubescent on both surfaces with uniseriate hairs mainly restricted to the veins at maturity, veins inconspicuously raised. *Inflorescence* a compound dichasium; mostly dividing dichotomously, axillary, leaf-opposed or pseudoaxillary, 3 primary branches, 5–14 × 1–5 cm; peduncle 3–11 cm long. *Calyx* cupuliform, papillose, shortly lobed. *Petals* 1.5–2 mm long, papillose, greenish white to yellowish, apex not corniculate. *Stamens* 4, filaments 0.5–0.75 mm long, anthers c.0.5 mm long, oval. *Ovary*, lower part adnate to floral disc. *Floral disc* thick, lime green at anthesis. *Fruit* a berry, globose to oblate, 7–10 mm in diameter, purplish blue to black when mature. *Seeds* 2–4, triangular in dorsiventral view, c.3.5–5 × 3–4 mm; beak inconspicuous or extending c.1/5 of seed length, apex retuse, chalaza extending c.1/2 of seed length, ventral infolds with two shallow keel-shaped cavities, endosperm nearly T-shaped in cross-section.

Distribution. Australia (Queensland) and Papua New Guinea.

Distribution in New Guinea. Papua New Guinea: Central, East Sepik, Manus, Morobe, New Ireland, Sandaun, Western, and West New Britain (**Figure 1**).

Habitat and ecology. Forests, hills, from sea level to 1000 m.

Phenology. Flowering and fruiting throughout the year.

Proposed IUCN conservation category. *Causonis australasica* occurs only in Australia and Papua New Guinea. The EOO and AOO are calculated as 1,095,884 km^2 and 144 km^2, respectively. The EOO suggests that this species might be Least Concern, whereas the AOO suggests it might be Endangered. However, the species does not fulfil the other parameters required for the species to be assessed as Endangered (e.g. small number of locations, continued decline and extreme fluctuations), and therefore this species is classified as Least Concern (LC).

In New Guinea, the EOO is 529,883 km^2 and the AOO is 76 km^2. Similarly to the global conservation assessment, the EOO and AOO indicate a Least Concern and Endangered classification, respectively. However, again the additional parameters necessary for the species to be classified as Endangered are not met, and therefore *Causonis australasica* is classified as Least Concern (LC) in New Guinea.

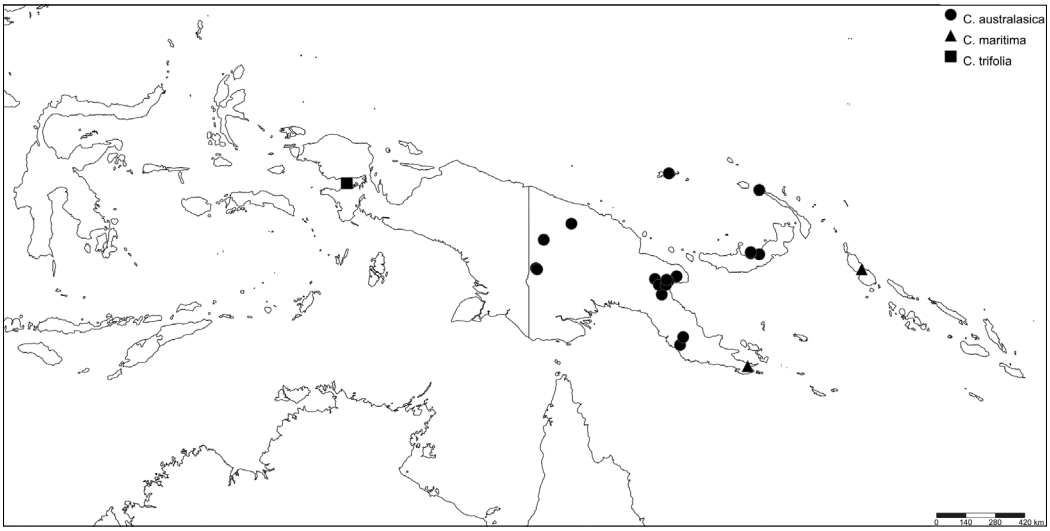

Figure 1. Map showing the distribution of *Causonis australasica*, *C. maritima* and *C. trifolia* in New Guinea.

Additional specimens examined. Papua New Guinea. **Central** province: Port Moresby subdistrict, Owens corner, c.2 miles from Owens Corner–Kokoda Trail due east, 9°25'12"S, 147°30'00"E, 24 v 1977, *Benjamin and Wiakabu* 67848 (K [K000871665], L [L.2335866]); Port Moresby subdistrict, near Boridi village, 9°5'S, 147°38'E, 2 x 1973, *Foreman and Vina* LAE60291 (K [K000871664], L [L.2335874]). **East Sepik** province: Hunstein Range, near site 'Gipa', along the main stream course, 4°28'S, 142°43'E, 15 vii 1990, *Takeuchi* WT6115 (K [K000871631], L [L.4253880]); Ambunti, Mt Townsend, 4°11'57"S, 142°48'43"E, 17 ix 1990, *Takeuchi* 6950 (BO [BO-1943768], K, L [L.4254789]). **Manus** province: Manus Island, near Kari Village, c.5 km inland from N. coast in Mundrau limestone depression, 2°2'S, 147°1'E, 19 xi 1975, *Sands, Pattison and Wood* 2698 (K [K000871673]). **Morobe** province: Finschafen subdistrict, Near Arigenang Village, 6°28', 147°21', 14 ii 1970, *Foreman* NGF48104 (K [K000871634]); Bulolo, 7°15'00"S, 146°42'36"E, 9 ii 1950, *Fryar* NGF3987 (K [K000871671], L [L.2335870]); Oomsis logging area, 6°35'S, 146°25'E, 23 x 1959, *Henty* NGF11580 (K [K000871668, K000871670], L [L.2329293]); Busu river, 6°40'S, 147°E, 14 i 1964, *Henty* NGF16740 (K [K000871635, K000871632], L [L.2329292]); Tuamini river, Lae–Wau road, 6°50'S, 146°35'E, 14 viii 1962, *Millar* NGF14608 (K [K000871639], L [L.2329298]); flood plain of Markham River, < 20 m, 6°40'59"S, 146°53'30"E, 11 iii 1993, *Takeuchi* 8849 (BISH n.v., L [L.4254214], LAE n.v., NSW n.v.); Lae, near Taraka Village, 6°37'S, 146°55'E, 9 xi 2012, *Wen and Applehans* 12300 (US). **New Britain** province: West Nakai, Galilo village, near cape Hoskins, 5°28'32"S, 150°32'57"E, 27 viii 1954, *Floyd* 3472 (K [K000871676]); Hoskins subdistrict, Tabai Rekau, 5°25'S, 150°30'E, 19 x 1968, *Millar* NGF40586 (K [K000871667], L [L.2329287]). **New Ireland** province: West of Kaut plantation, 2°45'S, 150°55'E, 16 ii 1967, *Coode and Katik* NGF29861 (K [K000871638], L [L.2335872]). **Sandaun** province: Telefomin, Hak river, 4°53'38"S, 141°37'08"E, 5 ii 1981, *Morren* 210 (K [K000871637]). **West New Britain** province: Hoskins subdistrict, on the road to Dagi, 5°31'S, 150°55'E, 21 xii 1967, *Coode and Lake* NGF32637 (K [K000871666], L [L.2335873]). **Western** province: Kiunga subdistrict, 6°7'S, 141°17'E, 21 vii 1967, *Ridsdale and Galore* NGF33443 (BO, K [K000871674], L

[L.2335868]); Kiunga subdistrict, 5 miles N.W. of Kiunga, Rumginae Rd., 6°10'S, 141°20'E, 12 vii 1971, *Streimann and Katik* 51855 (BO, K [K000871660], L [L.2329290]).

2. Causonis maritima (Jackes) Jackes, Telopea 23: 70 (2020).

Cayratia maritima Jackes, Austrobaileya 2(4): 366 (1987). – Type: Australia, Queensland, Cook, Lakefield National Park, 9.3 km north of Ranger's Cottage, 15.116°S, 144.316°E, 26 vi 1982, *Jackes, B.R. s.n.* (holotype BRI [barcode AQ0441384]; isotypes A [barcode 00051579], CANB [barcodes CANB 375543.1, CANB 375543.3, CANB 375544.2, CANB 375544.4], DNA [barcode DNA D0056167], K! [barcode K000072595], L! [barcodes L. 0763085, L. 0763086], MEL [barcode MEL 1582485A], NSW [barcode NSW 830674, NSW 171693]).

Herbaceous climber. *Stem* angular, 2–4 mm in diameter, very branched, usually glabrous with simple hairs at nodes when young; tendril 3-furcate (occasionally 2-furcate), slender, wiry, leaf-opposed, cylindrical, with a non-coiling section followed by coiling section, 1.5–14 cm long, glabrous, lacking adhesive discs at the tips. *Leaves* compound, 3-foliolate, alternate; petiole 1–8 cm long, hairy as on stem, central petiolule 0.5–2.5 cm long, lateral petiolules 1–8 mm long, hooked hairs sometimes present; central leaflet blade ovate to rhomboid, 1–10 × 1–7 cm, base cuneate to rounded; lateral leaflet blade 2–8 × 2–6 cm, base oblique; margin dentate to crenulose, apex acute; adaxial surface almost glabrous at maturity except for the presence of uniseriate 3- to 14-celled hooked hairs on the midrib, abaxial side usually glabrous, occasionally with hooked hairs at the junction of the petiole and the lamina; veins inconspicuous. *Inflorescence* a ramified, axillary, mostly dividing dichotomously, corymbose, compound dichasium, 2–12 cm long; peduncle 1.5–16 cm long, hairy as on leaf to glabrous, pedicels 1–3 mm long, papillose. *Buds* ovoid, 1.25–2 × 1–2 mm. *Calyx* cupuliform, entire, margin sinuate, 0.5–0.75 × 1.5–2 mm, papillose. *Corolla* petals 4, ovate, 1.25–2.25 × 1–2 mm, apex cucullate, papillose. *Stamens* 4; filaments flattened, broadening at the base, 0.5–1 mm long; anthers orbicular, medifixed, 0.4–0.75 mm long. *Ovary* adnate to the disc; disc with 4 lobes, glabrous. *Style* conical, slender, 0.5–1 mm long; stigma inconspicuous. *Fruit* a berry, subglobose, 0.5–1.25 mm in diameter, glabrous, smooth, base attenuate. *Seeds* 2–4, triangular-obovoid, 5–7 × 4–7 mm, ventral infolds side conspicuous with 2 keels to cup-shaped cavities, dorsal side convex with a linear chalazal knot, endosperm nearly T-shaped in cross-section. See **Figure 2A, F–H**.

Distribution. Australia, Brunei, China, India, Indonesia (Borneo, New Guinea, Sulawesi), Malaysia, Moluccas Islands, Papua New Guinea, Singapore, Solomon Islands and Vietnam.

Distribution in New Guinea. Indonesia (Irian Jaya) and Papua New Guinea (Autonomous Region of Boubainville, Milne Bay) (see **Figure 1**).

Habitat and ecology. Coastal, alluvial or sandy soil, swamps, forest edge, regrowth; near sea level to 3500 m.

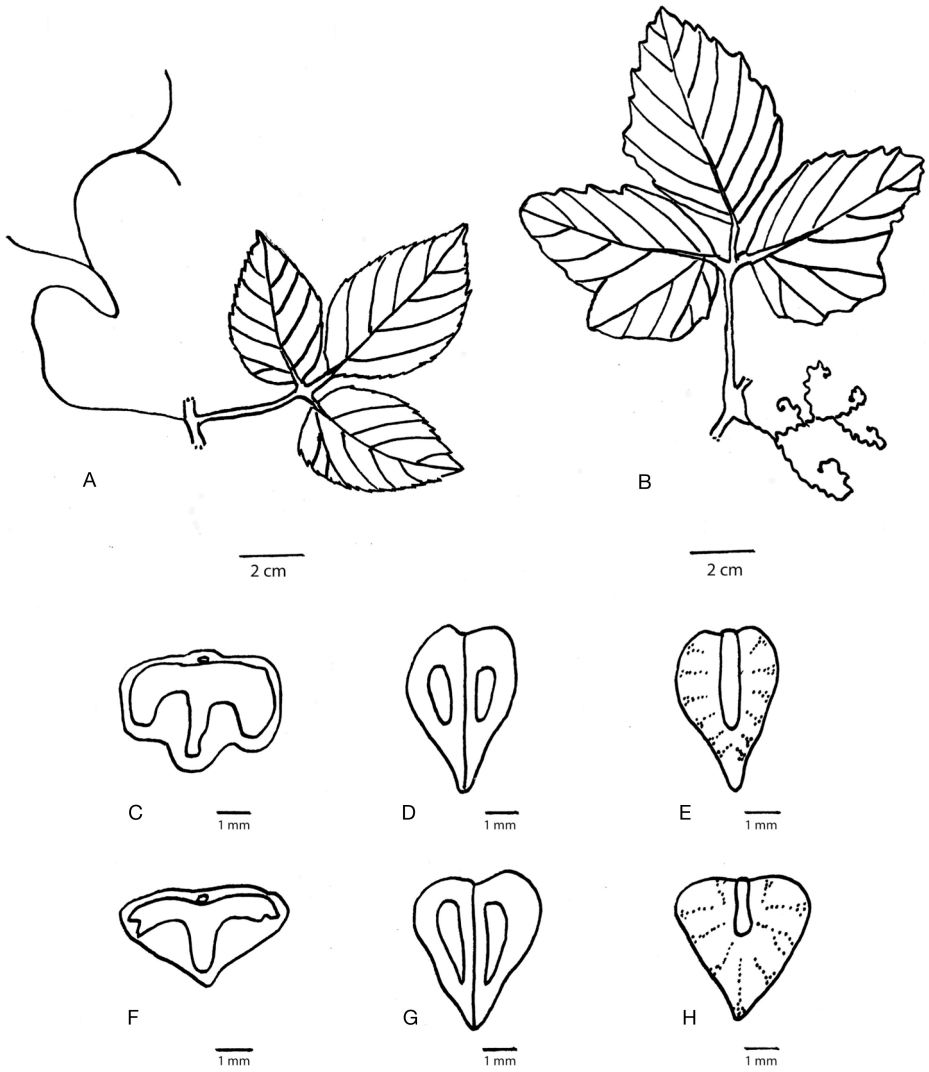

Figure 2. Distinctive characters in New Guinea *Causonis*. A and B, Tendrils: A, *Causonis maritima*; B, *C. trifolia* (adapted from Jackes, 1987). C–H, Seeds: C–E, *Causonis trifolia* (C, cross-section; D, ventral view; E, dorsal view); F–H, *Causonis maritima* (F, cross-section; G, ventral view; H, dorsal view). Drawn by A. Trias-Blasi.

Phenology. Flowering and fruiting throughout the year.

Proposed IUCN conservation category. *Causonis maritima* is distributed from India and China to North Australia with no apparent threats, and therefore it can be treated as Least Concern (LC). In New Guinea, although we only have four collections, the EOO is calculated to be 676,693 km^2, and therefore it is also considered to be Least Concern (LC).

Additional specimens examined. Indonesia. **Irian Jaya**: Snow Mountains [Maoke Mountains]: Bernhard Camp Idenburg River [Taritatu river], 3°40'S, 140°15'E, iv 1939, *Brass* 13947 (K [K000871696], L [L.2329267]). NW New Guinea, Pionier bivouac, vi 1926, *Docters van Leeuwen* 9362 (BO [2 duplicates], K [K000871697]).

Papua New Guinea. **Autonomous Region of Bougainville** province: SW of Toiumonapu Plantation, 6°10'S, 155°20'E, 2 vii 1963, *van Royen* NGF16418 (BO, K [K000871707], L [L.2329188]). **Milne Bay** province: Subdist Alotau, Haumo River, 3 miles out of Alotau on road to Gurney 2 miles east of Rabe village, 10°20'S, 150°25'E, 21 iii 1976, *Larivita* LAE70553 (K [K000871688; sheet 2]).

3. Causonis trifolia (L.) Mabb. & J.Wen in Mabberley, Pl.-Book, ed. 4, 1101 (2017).

Vitis trifolia L., Sp. Pl. 203 (1753); *Cissus trifolia* (L.) K.Schum. in Schumann & Hollrung, Fl. Kais. Wilh. Land 71 (1889); *Columella trifolia* (L.) Merr., Philipp. J. Sci., C, 134 (1916); *Cayratia trifolia* (L.) Domin, Biblioth. Bot. 89: 370 (1927). – Type: India, Madras, "Pearmedoor, about 16 or 17 miles from Fort St George", 27/28 v 1969, Herb. Sloane 165 (Petiver): 84, *Samuel Browne* 67 (BM-SL!, neotype, designated by Shetty & Singh, Taxon 37: 171 [1988]).

Cissus carnosa Lam., Encycl. 1: 31 (1783); *Vitis carnosa* (Lam.) Wall. ex M.A.Lawson in Hooker 654 (1875); *Cayratia carnosa* (Lam.) Gagnep., Notul. Syst. 347 (1911). – Type: [illustration] India, "Tsjori-Valli" in Rheede tot Draakestein, Hort. Malab. 7: t. 9 (1688) (lectotype, designated by Mabberley in Dassanayake *et al.*, Handb. Fl. Ceylon 9: 458 [1995]).

Cissus obtusifolia Lam., Encycl. 1: 31 (1783). – Lectotype (designated by Parmar *et al.*, Taxon 70(6): 1214 [2021]): India., *s.d.*, *J.B. Lamarck s.n.* (P [barcode P00295584!]).

Cissus cinerea Lam., Tabl. Encycl. I: 332 (1791) ≡ *Cayratia trifolia* var. *cinerea* (Lam.) Quisumb., Philipp. J. Sci. 76: 47 (1944). – Lectotype (designated by Parmar *et al.*, Taxon 70(6): 1214 [2021]): East Indies, *s.d.*, *J.B. Lamarck s.n.* (P [barcode P00295579!]).

Vitis psoraliifolia F.Muell., Fragm. 2(13): 75 (1860) ≡ *Cissus psoraliifolia* (F.Muell.) Planch. in Candolle & Candolle, Monogr. Phan. 5: 567 (1887). – Type: not designated; original material: Australia. Northern Territory, on the riverbank of Victoria River, x 1855, *F. Mueller s.n.* (GH n.v., K n.v., MEL [barcodes MEL 540157!, MEL 540158!]; vide Jackes in Austrobaileya 2(4): 368 (1987).

Herbaceous climber. *Stem* terete, 1–4 mm in diameter, very branched, hairy with pale bent hairs 0.2–1 mm long to glabrous, slightly ridged; tendril 4- or 5-furcate, slender, wiry, leaf opposed, cylindrical, with a non-coiling section followed by coiling section, 2.5–10(–20) cm long, sparsely hairy to glabrous, mature tendrils usually forming adhesive discs at the tips. *Leaves* compound, 3-foliolate, alternate; petiole 1–6 cm long, hairy as on stem, central petiolule 0.4–2.5 cm long, lateral petiolules 2–8 mm long, hairy as on stem; central leaflet blade oval, lanceolate to ovate, 2–11 × 1–7 cm, base cuneate to rounded; lateral leaflet blade 2.5–7 × 2–6 cm, sometimes with a lateral lobe, base oblique; margin dentate to sinuate, apex acute to acuminate; adaxial surface almost glabrous except for the presence of hairs (like those on the stem) on the midrib to densely hairy with appressed hairs, abaxial

side moderately to densely hairy with hairs like these on the stem mostly concentrated on veins; veins protruding, 1 main basal vein, 4–8 pairs of secondary veins. *Inflorescence* a ramified, axillary, mostly dividing dichotomously, corymbose dichasium, 2–12 cm long; peduncle 1.5–8 cm long, hairy as on stem, pedicel 1–3 mm long, hairy with hairs to 0.1–0.2 mm long. *Buds* ovoid, 1.5–2 × 1–2 mm. *Calyx* cupuliform, entire, margin sinuate, 0.5–0.75 × 1.5–2 mm, hairy as in pedicel. *Corolla* petals 4, ovate, 2–2.25 × 1–1.5 mm, apex cucullate, sparsely to densely puberulent. *Stamens* 4; filaments flattened, broadening at the base, 0.75–1 mm long; anthers orbicular, medifixed, 0.4–0.75 mm long. *Ovary* adnate to the disc; disc with 4 distinct lobes, 0.5–1 × 1.5 mm, glabrous. *Style* conical, slender, 0.5–0.6 mm long; stigma inconspicuous. *Fruit* a berry, subglobose, 5–15 mm in diameter, glabrous, smooth, base attenuate. *Seeds* 2–4, triangular, 5–6 × 4.5–5 mm, ventral side keel-shaped, dorsal side convex with a linear chalazal knot, side ribbed; endosperm m-shaped in cross-section. See **Figure 2B, C–E**.

Distribution. Australia, Bangladesh, Brunei, Cambodia, China, India (including Andaman and Nicobar Islands), Indonesia (Borneo, Java, Lesser Sunda Islands, New Guinea, Sulawesi, Sumatra), Laos, Malaysia, Micronesia, Moluccas, Myanmar, Nepal, Palau, Pakistan, Papua New Guinea, Philippines, Singapore, Solomon Islands, Sri Lanka, Thailand, Vanuatu and Vietnam.

Distribution in New Guinea. Indonesia: Irian Jaya (see **Figure 1**).

Habitat and ecology. Forests on hillsides or by streams, on rocks; around 70–1300 m altitude.

Phenology. Flowering and fruiting throughout the year.

Proposed IUCN conservation category. *Causonis trifolia* is a widespread species across Asia with no apparent threats, and therefore it can be treated as Least Concern. In New Guinea, we have been able to confirm the identity of ony one specimen because it was the only one bearing fruits, but it is extremely likely that the species is widespread in the country. As such, the species is classified as Least Concern (LC).

Additional specimen examined. Indonesia. **Irian Jaya**: Bomberai Peninsula, Tangguh survey area, S of Tanah Mera, 2°27.4'S, 133°7.4'E, 20 ii 2002, *Takeuchi, Sambas & Maturbongs* 15982 (BO [BO-1486756], K, L [L.3928844, L.3928845]).

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