Excerpt from:

Anderson, W. R. 1981. Malpighiaceae *in* The botany of the Guayana Highland, Part XI. Mem. New York Bot. Gard. 32: 21–305.

5. Blepharandra Grisebach, Linnaea **22**: 7. 1849.

Trees or shrubs, the hairs often basifixed or sub-basifixed, the leaves eglandular, the lamina with many (12–20 or more) fine, parallel lateral veins on each side interconnected by a fine, elaborate reticulum, the stipules intra- and epipetiolar, free from each other but often basally connate with opposite stipules to form an interpetiolar sheath. Inflorescence a thyrse or pseudoraceme composed of 1–several-flowered cincinni. Bracts and bracteoles eglandular. Sepals all biglandular. Petals white, pink, or red (1 yellow in *B. hypoleuca*), the lateral 4 spreading to reflexed, the posterior erect or spreading. Stamens 10, all fertile, the filaments free, flat, hirsute with straight basifixed hairs, the anthers alike, with 2 linear locules bearing at least apical tufts of basifixed hairs and often hirsute on the sides as well. Receptacle bearing long basifixed hairs inside or all around the stamens. Ovary of 3 quite connate carpels, 1 ± anterior and 2 ± posterior, spheroid or conoid, glabrous; styles 3, inbent in bud, subulate with minute apical stigmas, glabrous, deciduous in fruit. Fruit a tiny, spheroid or ovoid, 3-angled, dry, indehiscent, nut-like capsule with a bony and often rugose endocarp, glabrous. Embryo with the cotyledons folded (mature seeds not seen).

Type. *Blepharandra hypoleuca* (Bentham) Grisebach.

[6] Plants from the Chapada da Diamantina near Morro do Chapéu in Bahia may have the crypts poorly developed or absent, so that the epidermis below is more or less smooth and not white; in other respects they agree well with other collections of *V. glaucophylla*.

Blepharandra comprises six species, divided here into two geographically and ecologically disjunct sections. Section *Blepharandra* occurs in Guyana and southern Venezuela, while section *Callyntranthele* is found only in Amazonas, Venezuela, and Amazonian Brazil. Where the sections meet, at Cerro Duida, the plants of section *Blepharandra* grow high on the slopes of the tepuí, at elevations of 1400 m or more, while those of section *Callyntranthele* are from lowland savannas at elevations of 400 m or less.

Blepharandra is clearly very closely related to *Diacidia,* a fact that has been overlooked by previous workers (Niedenzu put them in different tribes). Basifixed hairs, exfoliating glaucescence, and lacerate sepals are all present in both genera and otherwise rare in the Malpighiaceae. Accrescent sepals are the rule in *Diacidia* and are found also in *Blepharandra* section *Blepharandra*; they occur sporadically elsewhere in the family, including some species of *Byrsonima*. Stiff awn-like hairs at the apex of the anther are found only in *Blepharandra* and *Diacidia,* and the tiny, dry, indehiscent fruit of these two genera is peculiar to them.

Key to the Species of *Blepharandra*

1. Stipules acute or acuminate at the apex, deciduous before the leaves. Section *Blepharandra.*
   2. Sepals, most bracteoles, and some bracts bearing gland-tipped marginal processes 1–2 mm long; leaves light green below, not glaucous; leaves, vegetative internodes, and abaxial surface of the stipules glabrous. 1. *B. fimbriata.*
   2. Sepals, bracteoles, and bracts entire or denticulate; leaves white- or yellowish-glaucous below; petioles, internodes, and abaxial surface of the stipules densely hairy, leaf blades densely hairy to glabrate below. 2. *B. hypoleuca.*
1. Stipules rounded at the apex, persistent on the leaf-base. Section *Callyntranthele.*
   3. Lamina cuneate or truncate at the base.
      4. Petals all pink, turning white in age; sepals glabrous adaxially or sparsely sericeous near the margin, sericeous abaxially; free lobes of the stipules 2.5–4 mm long; pubescence of the inflorescence light to dark brown; pedicel 5–6(–7) mm long; largest leaves with the lamina 1.5–3 cm wide, the margin thick and non-revolute. 3. *B. angustifolia.*
      4. Lateral 4 petals white, the posterior pink; sepals densely sericeous on both sides; free lobes of the stipules 4–7 mm long; pubescence of the inflorescence white; pedicel 8–10(–13) mm long; largest leaves with the lamina (2.5–)3–7 cm wide, the margin thin and often revolute. 4. *B. heteropetala.*
   3. Lamina cordate at the base.
      5. Lateral 4 petals white, the posterior pink; sepals entire or bearing 1–several short, obscure processes; hairs at apex of anther 1–1.2 mm long. 5. *B. intermedia.*
      5. Petals all pink, the posterior darker, all turning white in age; sepals lacerate into many cilia; hairs at apex of anther up to 0.6 mm long. 6. *B. cachimbensis.*

Section **Blepharandra**

1. Blepharandra fimbriata B. MacBryde, Canad. J. Bot. **52**: 2437. 1974. Fig 13.

Weak shrub, prostrate to erect, up to 2 m high; vegetative stems terete, glabrous except for tufts of ferrugineous hairs at the nodes. Lamina of the larger leaves 3.5–8 cm long, 1.7–3.8 cm wide, elliptical, cuneate, truncate, or subcordate at the base, obtuse or rounded and sometimes apiculate at the apex, glabrous on both sides, dark green above, light green but not glaucous below, coriaceous, the margin red and thickened, flat or usually revolute, the veins and reticulum visible

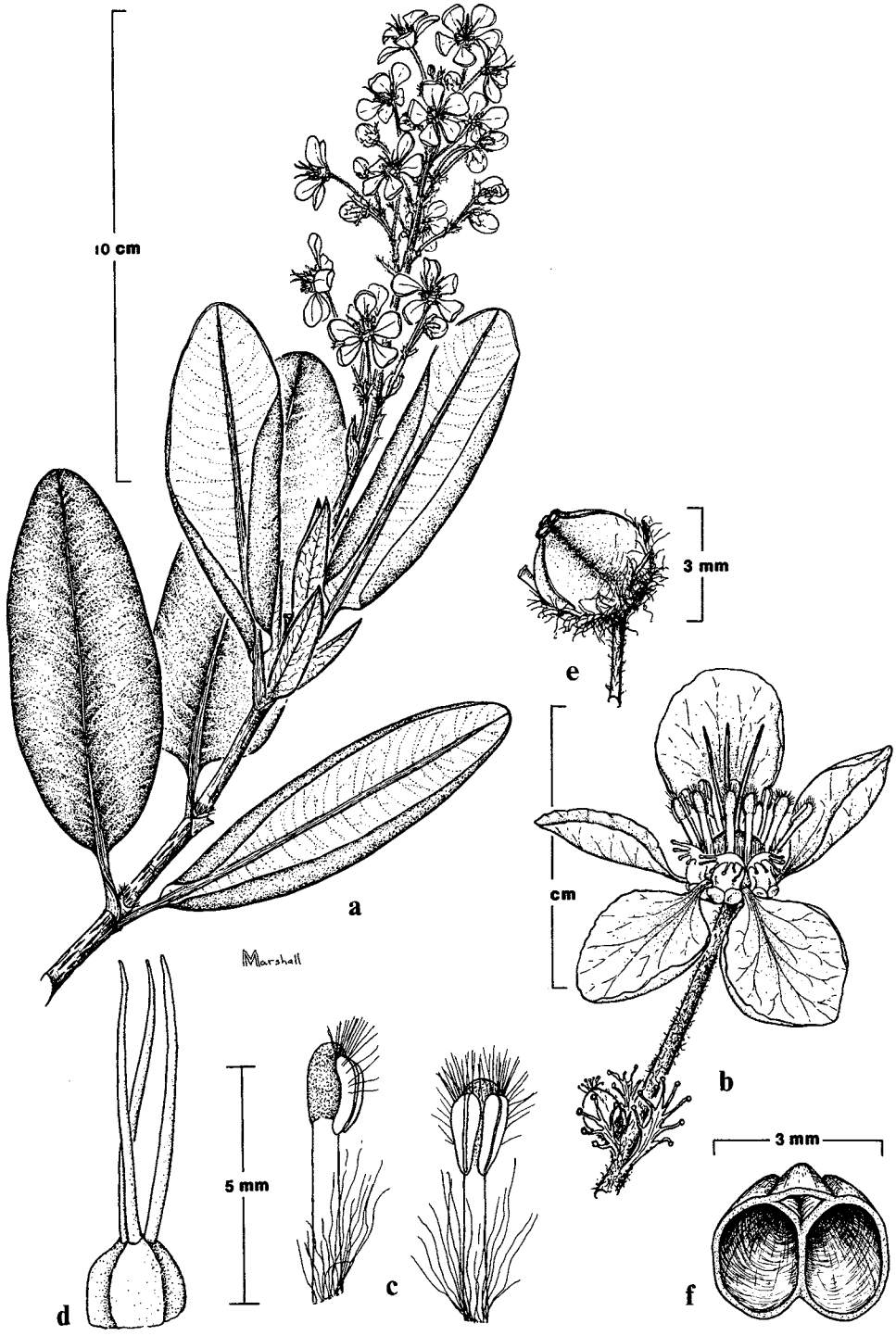

Fig 13. *Blepharandra fimbriata*. a) Flowering branch; b) flower; c) stamens, lateral view (left) and adaxial view (right); d) gynoecium; e) fruit; f) fruit in cross section, seeds removed, showing two locules fertile and one sterile. Drawn from *Maguire 33002* by Melissa Marshall.

or prominulous on both sides; petiole 5–15 mm long, glabrous, often dark red, the bases of opposite petioles briefly connate; stipules foliaceous, 11–30 mm long, 4–7 mm wide, ovate or elliptical, often asymmetrical, acute or acuminate at the apex, free, deciduous well before the leaves, the veins prominent on both sides, abaxially glabrous, adaxially tomentose especially at the margins and bearing a tuft of basifixed ferrugineous hairs at the base. Inflorescence a terminal thyrse 10–14 cm long, the axis dark red or purplish and villous to proximally glabrate; bracts 4–10 mm long, 2–4 mm wide, triangular or lanceolate, flat, entire or bearing few to many gland-tipped marginal processes 1–2 mm long, glabrous or ciliate on the margin, persistent or belatedly deciduous; cincinni 1–4-flowered, the primary peduncle 5–13 mm long, villous; bracteoles like the bracts but smaller. Pedicel 5–14 mm long, sparsely to densely villous. Calyx with glands ca 1.5 mm long and slightly detached at the apex, the sepal lobes often red, triangular, 3–4 mm long, 1.5–2 mm wide, bearing 2–10 gland-tipped marginal processes ca 1 mm long, revolute, glabrous or tomentose on the margins and above the glands, slightly accrescent in fruit (up to 7 mm long and 3 mm wide). Petals white, glabrous, flat or somewhat concave, erose or denticulate, the lateral 4 with the claw 1.5–2 mm long and the limb 5.5–6.5 mm long and wide, subcircular, the posterior petal with the claw 2–2.5 mm long and the limb 6.5–7.5 mm long and wide, subcircular or obovate. Filaments 3–4 mm long, bearing many straight basifixed hairs at the base and few to none distally; anthers 1–1.5 mm long, each locule bearing many straight basifixed hairs in a tuft over the apex and usually in a row down the outer side and often barbate at the base, the connective slightly exceeding the locules at the apex. Pollen slightly prolate, tricolporate, the colpi short, the ora elliptical, oriented at 90° to the colpi and almost as long as them. Ovary 1.3 mm high, with all 3 carpels fertile or the anterior empty and smaller; styles 5–6.5 mm long, often reddish. Fruit 3.5 mm high, 3.5 mm in diameter.

Type. *Cardona 944,* Cerro Guaiquinima, Alto Paragua, Bolívar, Venezuela, elev 1740 m, Oct 1943 (holotype US! isotype VEN!).

Distribution. Known only from Cerro Guaiquinima in Venezuela and the Ayanganna Plateau in Guyana. GUYANA. Upper Mazaruni River basin, Ayanganna Plateau, scrub on W side of Haieka River, 1–2 mi E of Chinowieng Village, elev 740 m, *Tillett et al 45266* (K, MICH, NY, US). VENEZUELA. Bolívar, Cerro Guaiquinima, Alto Paragua: type, q v; elev 1700 m, *Cardona 1107* (VEN); open scrub savanna, cumbre, elev 1800 m, *Maguire 32729* (MICH, NY, US, VEN); North Valley, elev 1600–1700 m, *Maguire 32955* (NY); slopes, ridges and quebradas in valley below SE escarpment, elev 1600–1700 m, *Maguire 33002* (NY, VEN); Salto del Río Szczerbanari (Río Carapo), 5°44′4″N, 63°41′8″W, elev 750 m, *Steyermark et al 113125* (MICH).

Collected in flower and fruit from August to January.

2. Blepharandra hypoleuca (Bentham) Grisebach, Linnaea **22**: 7. 1849.

Coleostachys hypoleuca Bentham, London Jour. Bot. (Hooker) **7**: 125. 1848.

Byrsonima cretacea Gleason, Bull. Torr. Bot. Club **58**: 378. 1931. Type. *Tate 533,* Cerro Duida, elev 4800 ft, Amazonas, Venezuela (holotype NY!).

Blepharandra cretacea (Gleason) Steyermark, Fieldiana (Bot.) **28**(2): 280. 1952.

Blepharandra cretacea var *composita* Steyermark, Fieldiana (Bot.) **28**(2): 281. 1952. Type. *Steyermark 58191,* Cerro Duida, elev 1700–1980 m, Amazonas, Venezuela (holotype F, isotype NY!).

Blepharandra ptariana Steyermark, Fieldiana (Bot.) **28**(2): 282. 1952. Type. *Steyermark 60310,* savanna between Santa Teresita de Kavanayén and base of Ptari-tepuí, elev 1220 m, Bolívar, Venezuela (holotype F, isotype NY!).

Shrubs or small trees 1–8 m tall; vegetative stems loosely sericeous, eventually glabrate. Lamina of the larger leaves 4.5–15.5 cm long, 3–9.5 cm wide, elliptical or ovate, truncate to deeply cordate at the base, slightly revolute at the margin, obtuse or rounded at the apex, coriaceous, green and glabrous above, glaucous and tomentose or sericeous to glabrate below, the glaucescence white and flaky or yellowish and granular, the hairs light brown to dark reddish-brown, usually a mixture of long straight reflexed hairs and short twisted hairs, the vesture varying greatly in abundance and persistence; petiole 2–14(–18) mm long, sericeous or tomentose to glabrate; stipules 5–17(–22) mm long, 3–9 mm wide, ovate or triangular, slightly asymmetrical, acuminate at the apex, free, deciduous before the leaves, often with a prominent midrib, tomentose on both sides and ferrugineous-hirsute adaxially. Inflorescence a terminal, simple or rarely ternate thyrse or pseudoraceme 5–20 cm long, densely and persistently villous or velutinous, the hairs light to dark brown; bracts 5–11 mm long, 2–3 mm wide, narrowly triangular, flat or navicular, entire or denticulate, abaxially villous or sericeous, adaxially glabrous, caducous; cincinni (1–)2–5-flowered, the primary peduncle (0–)2–12 mm long, villous or velutinous; bracteoles 2–7 mm long, 0.5–3 mm wide, linear to ovate, flat or slightly concave, entire or denticulate, abaxially villous to subglabrous and ciliate at the margin, adaxially usually glabrous, caducous or variably persistent. Pedicel 5–10(–16) mm long, villous or velutinous. Calyx with the glands 1–2 mm long, green or pink, circular or elliptical or obovate, often free at the apex, rarely rudimentary, the sepal lobes 2.5–4.5 mm long, 1.5–3 mm wide, triangular, revolute, entire or denticulate, abaxially tomentose or villous, adaxially glabrous or proximally tomentose, slightly accrescent in fruit (up to 5 mm long). Petals glabrous or with a few hairs at base of claw, erose or denticulate, the lateral 4 white, with the claw 1.5–2.5 mm long and the limb 3.5–5(–7) mm long and 4–5.5(–7) mm wide, subcircular, flat or concave, the posterior petal yellow or white, with the claw 2–3 mm long and the limb 4–5.5(–7.5) mm long and 4.5–6(–7.5) mm wide, concave or galeiform. Filaments 2–4 mm long, densely hirsute, especially at the base; anthers 1.3–2.5 mm long, each locule bearing many (rarely few) basifixed hairs (0.5–)0.7–1 mm long in a row over the apex and usually down the outer side, the connective slightly to prominently exceeding the locules at the apex. Ovary 1–1.5 mm high and wide, with all 3 carpels fertile; styles 4–7 mm long. Fruit 2.5–3.5 mm high and wide, contracted at the base.

Type. *Rob. Schomburgk II 677/Rich. Schomburgk 1043,* Roraima, Bolívar, Venezuela ["Guiana angl."] (holotype K; fragment of isotype NY!).

Distribution. Eastern Guyana, Bolívar, Venezuela, and Cerro Duida. GUYANA. Chinoweng, Wandabu Mountain, *Forest Dept. 7842* (NY); Krabu Savanna, on rocks in open, *Forest Dept. 7980* (NY); upper Mazaruni River, Imbaimadai Savannas, in shallow sand on sandstone, elev 550 m, *Maguire 32191* (K, MICH, NY); Pakaraima Mts, Kamarang River–Wenamu Trail, Samwarakna-Tipu, elev 1100 m, *Maguire & Fanshawe 32485* (K, MICH, NY, US), elev 3350 ft, *Maguire & Fanshawe 32561* (K, NY); Kamarang River Crossing, Kamarang Head, elev 2700 ft, *Maguire 33268* (NY); upper Mazaruni River basin, Merume Mts, open rocky places along trail from Partang Rapids to first falls of Partang River, elev

460–550 m, *Maguire et al 43886* (K, MICH, NY) and *43887* (K, MICH, NY); upper Mazaruni River, Membaru Creek, *Pinkus 28* (GH, NY) and *Pinkus 211* (NY); upper Mazaruni River basin, Kamarang River, top of Eboropu escarpment, elev 910 m, *Tillett & Tillett 45675* (K, MICH, NY, US), Utschi River above Falls, elev 830 m, *Tillett & Tillett 45845* (K, MICH, NY, US). VENEZUELA. Bolívar: Auyantepuí, *Cardona 237* (VEN); Cerro Aprada, Caroni, elev 900 m, *Cardona 1987* (NY, VEN): Río Surukun, Caroni, Perai-tepuí, elev 900 m, *Cardona 2099* (NY, VEN); Caroni, Cerro Acopán, elev 1800 m, *Cardona 2286* (VEN), elev 2100 m, *Cardona 2287* (VEN); Auyantepuí, elev 2100 m, *Cardona 2662* (NY, VEN); Auyantepuí, elev 1800–2000 m, *Foldats 2602* (NY, VEN); Salto Angel, *Foldats 7195* (VEN); Kavanayen, *Lasser 1807* (NY, VEN); Río Paragua, Cerro Guaiquinima, North Valley, elev 1600–1700 m, *Maguire 32981* (MICH, NY, VEN), *Maguire 33042* (MICH, NY, US, VEN); Gran Sabana, Ilu-tepuí, Mesa Grande, elev 1600 m, *Maguire 33354* (NY, VEN); Sororopan-tepuí, north-facing slope, *Maguire & Wurdack 33920* (MICH, NY, VEN); type, q v; Ptari-tepuí, rocky open portion of plateau on southeast-facing slopes, elev 1600 m, *Steyermark 59623* (NY, VEN); Chimantá Massif, Apácara-tepuí, elev 2000 m, *Steyermark 75697* (NY); Auyan-tepuí, dry granite hills, elev 1800 m, *Steyermark 93587* (VEN); Auyan-tepuí, elev 1850 m, *Steyermark 93660* (NY, VEN); Cerro Jaua, elev 1922–2100 m, *Steyermark 97908* (NY, VEN); Sierra Pakaraima, Cabeceras del Río Paragua (Aguapira), elev 1400 m, *Steyermark 107340* (NY); Meseta del Jaua, Cerro Sarisariñama, elev 1410 m, *Steyermark et al 108862* (NY); Meseta del Jaua, Cerro Jaua, elev 1750–1800 m, *Steyermark et al 109320* (NY); savanna of Río Uarama below Uarama-tepuí, NE of Luepa, elev 1220 m, *Steyermark & Nilsson 632* (NY, VEN); savanna and stream margin along caño E of high part of Torono-tepuí, elev 1975 m, *Steyermark & Wurdack 982* (MICH, NY, US, VEN); top of slope between Caño Mojado and Río Torono, at extreme N end of Torono-tepuí, elev 2152 m, *Steyermark & Wurdack 1052* (NY, VEN); Río Carun, Alto Paragua, *Tamayo 2469* (VEN); Auyan-tepuí, *Tate 1174* (NY, VEN). Amazonas, Cerro Duida: elev 2100 m, *Fariñas et al 284* (VEN), *352* (VEN), *531* (NY), *547* (VEN); Culebra Creek, elev 1600 m, *Maguire & Maguire 29088* (MICH, NY, VEN); Culebra Creek just above Culebra Falls, elev 1400 m, *Maguire et al 29742* (MICH, NY, US, VEN); elev 1675 m, *Steyermark 58126* (NY).

Collected in flower and fruit in all months.

This exceedingly variable species defies my best efforts to divide it into natural and useful taxa. An extensive series of collections has been studied, and as often happens with polymorphic species, the more collections one studies the harder it becomes to find groups of correlated characters. It is possible to divide the species on the basis of any of several arbitrarily selected characters, but the membership of the subdivisions keeps changing with the character selected. For this reason I have decided to reject the taxonomy of MacBryde (1970, p 46 et seq) and recognize only *B. hypoleuca*. Study of MacBryde's key (p 46) will illustrate the difficulties. *Blepharandra cretacea* has the leaves not truly sessile, but with petioles only about 2–3 mm long and obscured by the cordate leaf base. Many collections of otherwise typical *B. hypoleuca,* from various parts of the range, have the petioles 3–5 mm long. The next character, whether or not the leaf bases are "amplexicaul," is not really a separate character from the first. In plants with cordate leaf bases (a common condition in *B. hypoleuca*) the base

will be more or less "amplexicaul" depending on how short the petiole is. Leaf size is not a good basis for the separation, because small-leaved plants of *B. hypoleuca* are common. One can, without difficulty, find plants of *B. hypoleuca* with veins just as prominent as in *B. cretacea*. Number of hairs on the filament and anther is highly variable, with *B. cretacea* representing one end of a continuous series; the type of *B. cretacea* has more than 10 hairs per theca, and many collections of *B. hypoleuca* are intermediate between the "many" and "few" condition. Lest it be felt that the combination of these characters will still support *B. cretacea,* in spite of their individual weakness, I would point to the collections of *B. hypoleuca* from Auyan-tepuí. These collections are *Cardona 237* and *2662, Foldats 2602* and *7195, Steyermark 93587* and *93660,* and *Tate 1174*. In general these collections strongly resemble the collections from Cerro Duida that MacBryde calls *B. cretacea*. Most of the Auyan collections have been identified as *B. cretacea* by Gleason or Steyermark, but according to MacBryde's definition they have to be called *B. hypoleuca*. This is because he has chosen to place greatest emphasis on the length of the petiole and the number of hairs on the anther (the Auyan material has fewer anther hairs than usual for *B. hypoleuca,* but more than the Duida specimens). Thus one chooses a character to emphasize and ends up with *B. cretacea* sensu MacBryde or *B. cretacea* sensu Gleason and Steyermark. Neither seems to me to warrant recognition.

In such a variable species, some discussion of the nature and distribution of the more significant variation is necessary.

1. Leaf base. Every intermediate between truncate to deeply cordate can be found, with much variation even on the same plant. There is little geographical pattern, but the truncate leaf base is perhaps commoner in Guyana and easternmost Venezuela.

2. Leaf and bracteole vesture. With a few exceptions, the leaves on plants from Guyana have few hairs to begin with, and these are soon lost. In most western populations the leaves tend to be and remain more densely hairy. This same general trend holds for bracteoles.

3. Leaf size. Plants with very large and very small leaves have been collected throughout the range of the species, from the Upper Mazaruni River to Cerro Duida. Plants from higher on mountains and in more open vegetation seem often to have smaller, more appressed leaves, but the inconsistency of data on labels makes it hard to assess the significance of this tendency.

4. Inflorescence. Plants with large, many-flowered inflorescences have them "compound," i e each cincinnus consists of several flowers. Plants with tighter, fewer-flowered inflorescences have a reduction in the number of flowers per cincinnus, culminating in the pseudoraceme of some plants from Cerro Duida.

5. Stamen hairs. Most collections have many long, stiff, basifixed hairs on the filament and anther, especially at the apex of the anther. However, plants with relatively few shorter hairs on the anther have been collected on Auyan-tepuí, on the Chimantá Massif, and on Cerro Duida.

In addition to these characters, other interesting but apparently trivial variations occur. The sepals are nearly eglandular in *Foldats 2602,* and that plant also has the connective of the anther extended well beyond the locules, which condition occurs sporadically elsewhere to varying degrees. The stipules are more

belatedly deciduous in plants from Cerro Duida than is usual. *Steyermark & Wurdack 1052,* from Torono-tepuí, is notable for the size of its petals and their red claws, and the density and dark color of the tomentum in the inflorescence.

The variation in this species seems best interpreted as a combination of geographical clines, such as are found in many species and can be identified in herbarium material, and probably ecological variation and differentiation. The latter needs to be studied in the field, where careful analysis of the habitats and associated vegetation may yield an understanding of some of the diversity.

Section **Callyntranthele** (Niedenzu) Anderson, comb et stat nov

Callyntranthele Niedenzu, Ind. lect. Lyc. Brunsb. p. aest. 1897: 4. 1897.
Byrsonima series *Callyntranthele* (Niedenzu) Niedenzu, Arb. Bot. Inst. Ak. Braunsb. **5**: 57. 1914.

Type. *Blepharandra angustifolia* (Humboldt, Bonpland & Kunth) Anderson.

3. Blepharandra angustifolia (Humboldt, Bonpland & Kunth) Anderson, comb nov

Byrsonima angustifolia Humboldt, Bonpland & Kunth, Nov. Gen. Sp. Pl. **5**: 153 (4° ed.), *tab. 449.* 1821 [1822].
Malpighia pruinosa Sprengel, Syst. **2**: 384. 1825, nom superfl.
Callyntranthele angustifolia (Humboldt, Bonpland & Kunth) Niedenzu in Engler & Prantl, Nat. Pflanzenfam. Nachtr. zu **III**(4): 206. 1897.

Much-branched shrubs or small trees 1–6 m tall; stems terete, originally sericeous (always?), very soon glabrate. Lamina of the larger leaves 4.5–7.5(–8.5) cm long, 1.5–3 cm wide, elliptical or rectangular or narrowly obovate, cuneate to truncate at the base, obtuse to truncate and often slightly emarginate at the apex, coriaceous, flat, the margin white, thickened and not revolute, originally ciliate on the margin and tomentose at base of midrib above but very soon quite glabrate, densely areolate above, glaucous below, the glaucescence exfoliating to expose a prominulous reticulum; petiole 7–11(–18) mm long, often narrowly winged distally, glabrous; stipules persistent on the petiole, connate with adjacent stipules of the opposite leaf to form an interpetiolar sheath 2.5–4 mm long, the free lobes 2.5–4 mm long, rounded at the apex, abaxially glabrous, adaxially densely ferrugineous-hirsute. Inflorescence 5–12 cm long, terminal or axillary, a simple or ternate thyrse, the axis ferrugineous-sericeous to velutinous; bracts 2.5–7.5 mm long, ovate, concave, obtuse or rounded at the apex, abaxially sericeous, adaxially glabrous, deciduous before anthesis; cincinni (2–)3–6(–9)-flowered, the primary peduncle 1–3(–5) mm long, velutinous; bracteoles like the bracts but smaller. Pedicel 5–6(–7) mm long, velutinous, circinate in bud. Calyx with the glands (0.7–)1–1.5 mm long, the sepal lobes 2–3 mm long, 1.5–2.5 mm wide, entire, rounded at the apex, flat (not revolute), abaxially sericeous, adaxially glabrous or sparsely sericeous near the margin. Petals pink, turning white with age, glabrous or bearing a few hairs on the claw, the lateral 4 with the claw 1.5–2.5 mm long and the limb 3–4 mm long and wide, cordate, flat or concave, entire or denticulate, the posterior petal with the claw 2.5–3.5 mm long, the limb 3.5–5 mm long and 4–6 mm wide, subcircular, concave or galeiform, dentate. Filaments 2–3 mm long, bearing many straight basifixed hairs, these especially dense at the base; anthers 1–1.2 mm long, the locules clothed in many straight basifixed

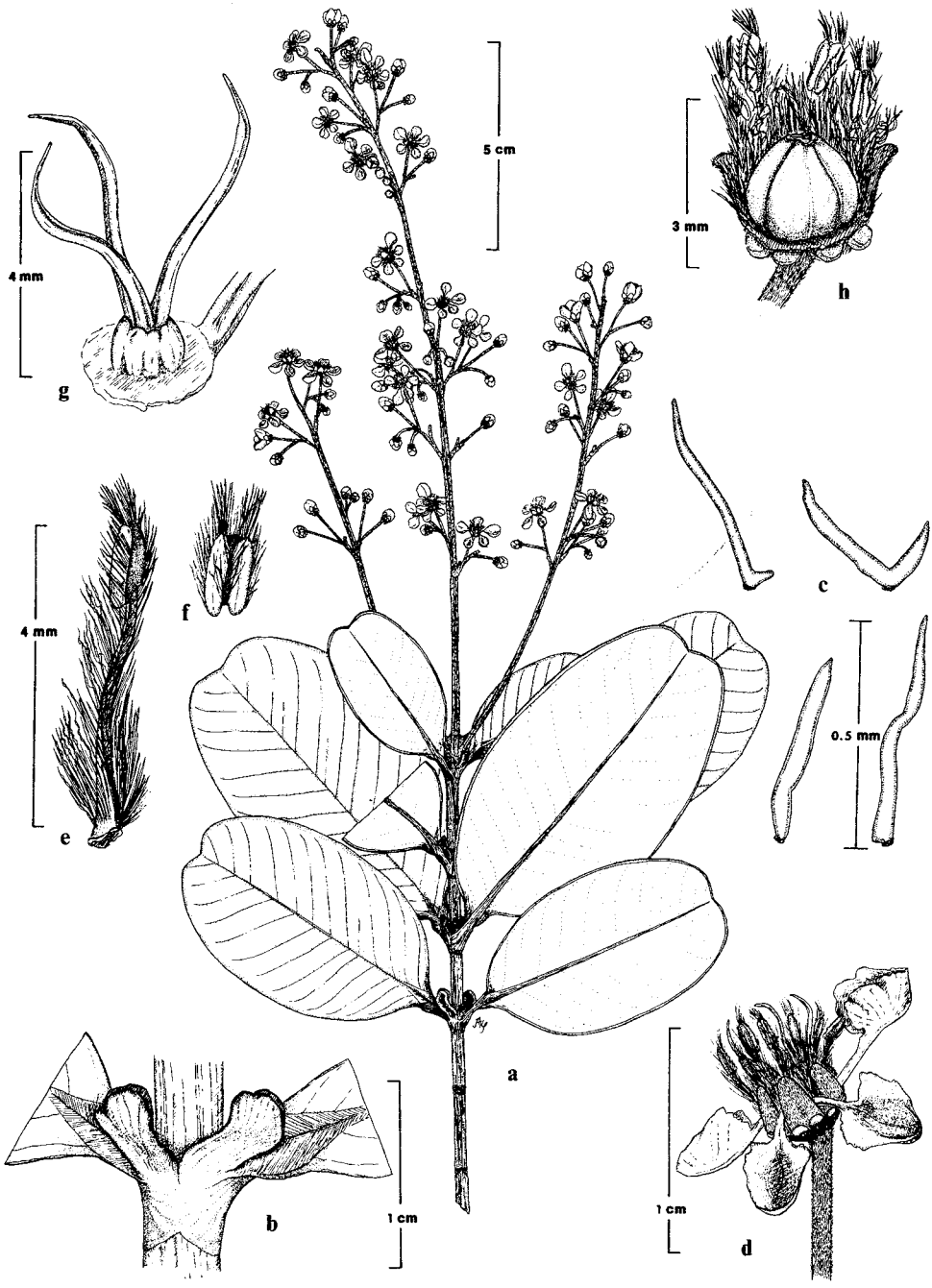

Fig 14. *Blepharandra heteropetala*. a) Flowering branch; b) stipules; c) hairs from inflorescence; d) flower; e) stamen, side view; f) anther, adaxial view; g) gynoecium, with base of posterior petal for orientation; h) fruit. a–g drawn from *Wurdack & Adderley 42704*, h from *Wurdack & Adderley 43672* by Annette Seidenschnur Mahler.

hairs, especially at the apex, the connective dark red or black, slightly exceeding the locules at the apex. Ovary 1.5 mm high, with all 3 carpels uniovulate; styles 4.5–5 mm long. Fruit 2.5–3 mm high, 3 mm in diameter, the seeds 3 (or fewer due to abortion).

Type. *Humboldt & Bonpland,* "juxta confluentem fluminis Atabapi et Orinoci," probably Amazonas, Venezuela (holotype P).

Distribution. Savannas between the Alto Río Orinoco and the Alto Río Negro. VENEZUELA. Amazonas: Santa Cruz, margin of Río Atabapo, near mouth of Río Atacavi, *Foldats 3658* (NY, VEN); Cerro Yapacana, Río Orinoco, dominant shrub of savanna, gold mine trail, elev 125 m, *Maguire et al 30779* (NY, VEN); Yapacana caño laguna, NW base of Cerro Yapacana, elev 125 m, *Maguire & Wurdack 34480* (MICH, NY, US, VEN) and *Maguire & Maguire 34501* (MICH, NY, US, VEN); Pacimoni savanna, on right bank of Río Pacimoni 50 km above mouth, elev 100–140 m, *Maguire et al 37576* (MICH, NY, VEN); Yapacana savannas, NW base of Cerro Yapacana, *Maguire et al 41484* (MICH, NY, VEN); above junction of Caño Cotua with Río Orinoco, SW of Cerro Yapacana, elev 100 m, *Steyermark & Bunting 103000* (NY, VEN); Caño Manomi/Casiquiare, *Vareschi 7786* p.p. (VEN). BRAZIL. Amazônas: Rio Curicuriary, alto Rio Negro, catinga na margem rochosa da cachoeira do Cajú, *Ducke s n* [RB 25233] (RB); Igarapé Toury, afl. do Rio Negro, beira da caatinga, ao longo da margem do rio, *Fróes 27897* (IAN).

Collected in flower from August to April.

The species treated by Cuatrecasas as *Byrsonima angustifolia* is actually an undescribed species of *Byrsonima,* which is described below as *Byrsonima bronweniana.*

4. Blepharandra heteropetala Anderson, sp nov Fig 14.

Frutex vel arbor 2–7 m alta, ramis vegetativis glabris (ab initio?), cicatricibus prominentibus. Foliorum majorum lamina 6–10 cm longa, (2.5–)3–7 cm lata, elliptica vel ovata, basi cuneata vel truncata, margine revoluta, apice emarginata, reticulo utrinque prominulo vel obscuro, subtus nunc glauca glaucidine tenui non exfoliata, nunc eglauca; petiolus (6–)8–12 mm longus, 3–5 mm proximalibus in vagina cum stipulis connatis, distaliter alatus; stipulae epipetiolares, in petiolo persistentes, cum stipulis oppositis in vagina interpetiolari 3–5 mm longa connatae, lobis liberis 4–7 mm longis, apice rotundatis, abaxialiter glabris, adaxialiter basi hirsutis apice glabris. Inflorescentia 7–20 cm longa, terminalis vel axillaris, simplex vel saepius ternata vel biternata, thyrsiformis, albovelutina, bracteis 2.5–5 mm longis, 1.5–2 mm latis, ovatis, concavis, abaxialiter subsericeis vel glabris, adaxialiter glabris, caducis, cincinnis 2–6-floriferis, velutinis, pedunculo primario 1–3 mm longo, bracteolis bracteis similibus sed minoribus et abaxialiter sericeis. Pedicellus 8–11 (in fructu 13) mm longus, velutinus pilis 0.3 mm longis, in alabastro circinatus. Sepalorum glandes 1.3–2 mm longae, obovatae, lobi (1.5–)2–3 mm longi, (1–)1.4–2 mm lati, triangulares, apice acuti vel obtusi vel rotundati, plani vel apice paulo revoluti, integri (vel obscure denticulati), utrinque laxe sericei. Petala glabra vel ungue paucipilifero; petala 4 lateralia alba, ungue 1–1.5 mm longo, limbo 3–4 mm longo, 2.5–4 mm lato, ovato, margine denticulato, paulo concavo; petalum posticum roseum, ungue 3–4 mm longo, 1 mm diametro, limbo

3.5–4.5 mm longo, 5–6 mm lato, galeiformi, margine denticulato. Filamenta 1.5–4 mm longa, utrinque densissime pilosa, pilis longissimis, tenuibus, basifixis; antherae 1–1.7 mm longae, connectivo atrorubro loculos aequanti vel paulo superanti, loculis pilosis pilis basifixis apice persistentibus rectis 1–1.2 mm longis; pollen tricolporatum. Ovarium conoideum vel sphaeroideum, 1–1.2 mm altum, 1.3–1.5 mm diametro, triloculare, loculis omnibus uniovulatis; styli 5–6 mm longi, patulo-ascendentes. Fructus 2 mm altus, 2.5 mm diametro, subsphaeroideus. Semina 3 vel abortu 2 vel 1, matura ignota.

Type. *Wurdack & Adderley 42704,* Sabanita Morocoto, right bank of Río Orinoco, 8 km below mouth of Río Atabapo, Amazonas, Venezuela, elev 125–150 m, 30 May 1959 (holotype MICH, isotypes NY, US, VEN).

Distribution. Savannas of the Alto Río Orinoco to campinas east and north of Manaus. VENEZUELA. Amazonas: Sabana de Morocoto, W of Cerro Morocoto, Río Orinoco below San Fernando de Atabapo, elev 150 m, *Level L-7* (MICH, NY, US, VEN); type, q v; Cerro Cariche, near left bank of Río Orinoco, half-way between Tama-Tama and San Antonio, elev 350 m, *Wurdack & Adderley 43672* (MICH, NY, US, VEN). BRAZIL. Amazônas: Manaus-Caracaraí Road, Km 140, white sandstone, *Berg et al P18162* (INPA, MICH) & Km 130, scrub forest on sandstone, *Berg et al P19507* (INPA, MICH); Rio Urubú, Maracaran, terrenos sêcos, altos e arenosos, *Fróes 25113* (IAN, US); Rio Urubú, *Fróes 25260* (IAN); Rio Aracá, sub-afl. do Rio Negro, solo arenoso, *Fróes & Addison 29280* (IAN, UB); Manaus-Caracaraí, Km 130, Igarapé Lages, disturbed campina, *Nelson & Lima P21058* (INPA, MICH); Rio Urubú, Ig. Cachoerinha, *N. Pereira* [MG 30278 & 30279] (MG); Campina da Lage, com blocos de arenito, Igarapé de Lage, *Pires & Leite 14536* (IAN); Manaus-Caracaraí Road, Km 130, Igarapé Lages, campina amongst sandstone rocks, *Prance 21031* (INPA, MICH); Manaus, Km 200 [near Rio Urubú], campina arenosa, *Rodrigues 7260* (INPA); low forest near Igarapé Lages, Km 130, *Steward et al P20250* (INPA, MICH).

Collected in flower in almost all months, most commonly from May to September.

Recently collectors have found in southern Amazônas a *Blepharandra* that is similar to *B. heteropetala* in stature and leaf-shape, but its leaves are smaller than usual and the flowers are reported to be white, with no mention made of the pink flag petal for which the species is named. Perhaps these populations represent *B. heteropetala* with some introgression from the southern species, *B. cachimbensis,* or perhaps they deserve recognition as yet another species in this complex. The collections are INPA 60468 from the Municipio de Lábrea and INPA 60667, 60670, and 60696 from Nova Prainha.

5. Blepharandra intermedia Anderson, sp nov Fig 18a–f.

Frutex usque 2 m altus, ramis vegetativis glabris. Folia appressa; lamina foliorum majorum 4–7 cm longa, 2.5–4.2 cm lata, elliptica vel oblonga, basi cordata, margine plana vel revoluta, apice rotundata et emarginata, coriacea, glabra, reticulo obscuro vel utrinque prominulo; petiolus 5–7 mm longus, glaber; stipulae 5–7 mm longae, 2–3 mm proximalibus in vagina cum petiolo et stipulis oppositis coalitis, 3–4 mm distalibus liberis rotundatis, abaxialiter glabrae, adaxialiter hirsutae in dimidio proximali. Inflorescentia 6–15 cm longa, terminalis, thyrsiformis, simplex vel ternata, albo- vel brunneo-velutina, cincinnis 2–3-floris, bracteis brac-

teolisque caducis, bracteis 2–4 mm longis, oblongis, margine ciliatis aliter glabris, bracteolis 1.5–3 mm longis, ovatis, abaxialiter sericeis. Pedicellus 7–10 mm longus, velutinus. Flos et fructus velut in *B. heteropetala.*

Type. *Pires & Leite 14840* [IAN 144455], Rodovia Perimetral Norte 20 km a leste de Caracaraí, Terr. Roraima, Brazil, 1 Jul 1974 (holotype IAN, isotype NY).

Distribution. BRAZIL. Terr. Roraima: R. Anauá, caatinga de Barcella, Apr flr/imm frt, *Pires et al 14453, 14483 & 14493* (all MICH); type, q v.

This plant is quite intermediate between *Blepharandra cachimbensis* and *B. heteropetala,* having the stature and small cordate leaves of the former and the pink and white petals, nearly or quite entire sepals, and long anther-hairs of the latter. Its status as a species depends on morphological discontinuities that may or may not be reinforced by further collection. It may have arisen through relatively recent hybridization between *B. heteropetala* and the mostly southern *B. cachimbensis,* which was recently collected for the first time north of the Amazon (*Coelho 784*).

6. Blepharandra cachimbensis Anderson, Bol. Mus. Bot. Mun. (Curitiba) **26**: 1. 1976.

Shrubs 1–2(–3) m tall; vegetative branches glabrous. Lamina of the larger leaves (2–)2.5–6(–6.6) cm long, 1.5–4 cm wide, elliptical, cordate at the base, flat or slightly revolute at the margin, rounded and very often emarginate at the apex, glabrous, coriaceous; petiole 2–4 mm long, glabrous; stipules 4–8 mm long, persistent on the petiole, connate with adjacent stipules of the opposite leaf to form an interpetiolar sheath, the lobes free, rounded at the apex, abaxially glabrous, adaxially hirsute at the base. Inflorescence 5–15 cm long, a terminal simple or ternate thyrse, densely white- or brown-velutinous; bracts 4–8 mm long, 3–5 mm wide, triangular or ovate, concave, denticulate, caducous; cincinni 3–6-flowered; bracteoles like the bracts but smaller. Pedicel 5–12 mm long, velutinous. Calyx with the glands 1–2.5 mm long, obovate, the sepal-lobes 2.5–4 mm long, 1.7–2.5 mm wide, ovate, very broadly rounded at the apex, lacerate at the margin into many long cilia, usually distally revolute, sericeous on both sides. Petals all pink, the posterior darker than the lateral 4, all turning white in age; lateral 4 petals with the claw 1.5–2.3 mm long, the limb 3.5–5 mm long, 4–5.3 mm wide, orbicular, slightly concave, entire or denticulate; posterior petal with the claw 2.5–4 mm long, the limb 5.5–6.5 mm long, 6–7.5 mm wide, flat or concave or slightly corrugated, obtusely denticulate. Filaments 2.5–4.2 mm long, free or very slightly connate, very densely pilose on both sides, the straight, slender, basifixed hairs especially dense on the proximal half; anthers 1–2 mm long, the locules bearing relatively few, often caducous hairs on their sides and a cluster of 8–16 straight, basifixed hairs up to 0.6 mm long at the apex of each locule, the connective dark red, slightly exceeding the locules at the apex. Ovary spheroid, 1.4–2 mm in diameter, glabrous, with all 3 locules uniovulate; styles 4–5 mm long, glabrous. Fruit 2.5–3 mm in diameter, 2–2.5 mm high, subspheroid, glabrous, the seeds 3 (or fewer due to abortion).

Type. *Anderson 10896,* upper, drier part of sandy floodplain between Rio Cururú and Missão Velha, Alto Tapajós, Pará, Brazil, elev ca 200 m (holotype IAN, isotypes MICH, NY).

Distribution. Sandy campos in Amazonian Brazil, mostly in the south. BRA-

ZIL. Pará: Serra do Cachimbo, *Alvarenga* [RB 90557] (RB); type, q v; NW edge of Serra do Cachimbo, among rocks of blocky sandstone, *Anderson 10965* (IAN, MICH, NY); Cachimbo, no campo, no meio das pedras, *Bockermann 185* (SP); Alto Tapajós, Rio Cururú, Missão Velha, campo alagavel, *Egler 1040* (HB, IAN, MICH, MG, NY); Serra do Cachimbo, *Pereira 1777* (RB), *Pires et al 6112* (IAN, NY), *Prance et al 25236* (MICH), *Sick B.621* (HB, RB); Rio Teles Pires, São Benedito, *Silva 3672* (MICH). Amazônas: Estrada Manaus-Caracaraí, Km 60, *D. Coelho 784* (INPA); próximo do R. Tucunuri, Prainha, campo cerrado, *Pena 328* (IAN); margém do Rio Aripuanã, campo cerrado, *Ribeiro 371* (IAN). Terr. Rondônia: Igarapé Preto, RADAM ponto 61-Q XB-SC-20, solo de arenito, campo cerrado, *Ribeiro 1096* (MICH).

Collected in flower in almost all months.

6. Diacidia Grisebach in Martius, Fl. Bras. **12**(1): 119. 1858.

Sipapoa Maguire, Mem. New York Bot. Gard. **8**(2): 124. 1953.

Trees, shrubs, or subshrubs, with mostly basifixed or sub-basifixed hairs, the leaves eglandular; proximal portion of stipules and petioles fused to form an interpetiolar sheath; distal portion of stipules (the part extending beyond the petioles) free or connate. Inflorescence a simple or compound thyrse (i e a raceme or panicle of cincinni) or a pseudoraceme (i e a raceme of 1-flowered cincinni); bracts and bracteoles eglandular. Sepals all biglandular, slightly (subgenus *Diacidia*) or greatly (subgenus *Sipapoa*) accrescent in fruit. Petals yellow, often with red claws, glabrous or with a few hairs at base of claw; lateral petals spreading or reflexed, posterior petal erect, its claw stouter than in the laterals and its limb a different shape. Stamens 6–10; filaments flattened, free or especially the posterior 3(–5) up to ½ connate, abaxially glabrous, adaxially hirsute at the base; anthers deciduous, alike, 2-locular, each locule bearing at the apex and angled forward 1(–2) stout, basifixed, awn-like hairs [hence the name of the genus, meaning two-barbed], the connective equalling the locules or extended and bent forward between them at the apex; pollen tricolporate. Receptacle hirsute between filaments and ovary. Ovary glabrous, syncarpous, spheroid or conoid, 1–1.5 mm high, composed of 3 carpels but only 2-locular, the anterior carpel reduced to a ridge of tissue; styles 3, glabrous, straight, subulate, 2–4 mm long, unequal, one or both of the 2 posteriors shorter than the anterior, the stigmas minute and slightly internal. Fruit a spheroid or ovoid, dry, indehiscent, nut-like capsule ca 2.5 mm high and wide, glabrous, with a thin exocarp and a bony, smooth or rugose endocarp and containing 2 seeds (or 1 due to abortion), subtended and enclosed by accrescent (in subgenus *Sipapoa* red, membranous, veiny, wing-like) sepals.

Type. *Diacidia galphimioides* Grisebach.

I have given careful consideration to Dr. Bassett Maguire's (1969) bases for maintaining *Sipapoa* distinct from *Diacidia*. The ones with which I can agree are given in the key below; for the others (habit, leaf size, anther pubescence, substrate, geographical range), recent collections or observations have eroded their ability to separate the two groups. With its reduced androecium and accrescent sepals, *Sipapoa* is obviously a natural group, but its close relationship to *Diacidia* is equally obvious. Since I prefer to emphasize relatedness at the generic level,