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BARNEBYA, A NEW GENUS OF MALPIGHIACEAE FROM BRAZIL

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Anderson, William R., and Bronwen Gates (The University of Michigan Herbarium, North University Building, Ann Arbor, MI 48109). *Barnebya*, a new genus of Malpighiaceae from Brazil. Brittonia 33: 275–284. 1981.—The new genus **Barnebya** is described and illustrated and its systematic position in the Malpighiaceae is discussed, especially its similarity in some respects to the primitive subfamily Byrsonimoideae and in other respects to the Old World genus *Acridocarpus*. Two species are recognized, **B. dispar** comb. nov. and **B. harleyi** sp. nov.; these are described and illustrated and a key is provided for their distinction.

Two problems in the systematics of the Malpighiaceae concern the paucity of links between the primitive subfamily Byrsonimoideae and the rest of the family and the New World origins of the several Old World evolutionary lines. The genus described in this paper sheds some light on both of these problems. We are, therefore, especially pleased to name this wonderful genus in honor of our great friend, Rupert Charles Barneby.

Barnebya W. Anderson & B. Gates, gen. nov.

Arbores vel frutices scandentes. Folia alterna; lamina subtus glandulis impressis instructa; petiolus eglandulosus; stipulae nullae. Inflorescentia terminalis, thyrsiformis, ex cincinnis 1–3-floris composita, pedunculis pedicellisque longis et gracilibus. Flos calyce, corolla, et androecio perigyno, pilis basifixis caespitosis inter sepala et filamenta. Sepala 5 omnia biglandulifera, glandulis obovatis, arcte compressis, aliquot vel omnis in pedicello decurrentibus. Stamina 10, omnia fertilia, filamentis inter se liberis, antheris longitudinaliter dehiscentibus; pollen 3 (–5) poris aequatoriis instructum, sine colpis. Gynoecium ex 3 carpellis uniovulatis compositum, carpellis late connatis per totam longitudinem ovarii; styli 3, liberi, inter se ± aequales, antheras solum 1–1.5 mm superantes, subulati, stigmatibus internis vel paene terminalibus. Fructus siccus, schizocarpicus, ex 3 samaris constans; samarae ala dorsalis longa, margine superiore (adaxiali) incrassata; nux lateribus laevis, sine carpophoro basali-dorsali, areola ventrali grandi; samara ex toro trigono decidua, postremo in receptaculo affixa solum per 2 costas coriaceas margine areolae ventralis. Semen cotyledonibus crassis, subaequalibus vel inaequalibus, ± rectis.

Trees or woody vines. Leaves alternate, bearing impressed glands 0.3–0.9 mm in diameter below in the lamina; petiole eglandular; stipules none. Inflorescence terminal, the dominant axis terminal and unbranched or with several to many weaker axes arising from near the base, each axis thyrsiform, i.e., a raceme of 1–3-flowered cincinni, the peduncles and pedicels long and slender. Flower with the calyx, corolla, and androecium perigynous, the calyx lobes and petals borne on the rim of a concave receptacle, the filaments departing below the rim, and the ovary borne in the base. Sepals 5, all biglandular, the glands yellow, tightly compressed, obovate, some or all decurrent on the pedicel; sepals broadly rounded, abaxially glabrous, ciliate on the margin, adaxially glabrous except for a thick band of straight or twisted basifixed hairs at the base, adjacent to the filaments. Petals 5, yellow, with short thick claws 0.6–1 mm long, the posterior petal erect, the lateral 4 ± spreading. Stamens 10, all fertile, yellow; filaments short, alike, glabrous, free from each other, attached to base of connective; anthers in 2 distinctly alternating ranks in bud, the outer opposite sepals and longer, the inner opposite petals and shorter, all with longitudinal dehiscence, the connective dark but not glandular, not or hardly exceeding locules at apex; pollen 22–27 μm in diameter, oblate, with 3 (–5) large equatorial pores and no colpi. Gynoecium of 3 carpels, 1 anterior and 2 posterior, broadly connate for the whole length of the ovary; ovary densely sericeous, with 3 locules, each locule containing 1 ovule;

styles 3, free, ± alike, glabrous or hairy only at the base, exceeding the anthers by only 1–1.5 mm, subulate, the stigmas nearly apical to internal. Fruit dry, schizocarpic, comprising 3 samaras (or fewer due to abortion), each samara with an elongated dorsal wing thickened on the adaxial margin, the veins bending away and ending in the thinner abaxial margin; nut large and inflated, with a prominent reticulum but without lateral wings or crests, lacking a basal-dorsal carpophore, with an elongated ventral areole where the 3 nuts fit together, separating from an elongated 3-faced torus, finally attached to the receptacle only by 2 coriaceous ribs at the margin of the areole. Seed with the cotyledons thick, subequal or unequal, ± straight with neither bent back at the apex.

TYPE SPECIES: *Barnebya dispar* (Grisebach) W. Anderson & B. Gates [*Byrsonima dispar* Grisebach].

Barnebya is a most intriguing genus. The bizarre taxonomic history of *B. dispar* sums up the situation nicely. This species was first assigned to *Byrsonima* by Grisebach on the basis of its flowers. Then it was transferred by Niedenzu, on the basis of its fruit, to *Banisteria* (now *Banisteriopsis*), which is about as different from *Byrsonima* as a genus can be and still belong in the Malpighiaceae. In the discussion that follows we shall show that Grisebach was probably much closer to the truth than Niedenzu and that the genus most nearly related to *Barnebya* is the farthest away, across the Atlantic Ocean in Africa.

Grisebach, an astute student of Malpighiaceae, assigned *Barnebya dispar* to *Byrsonima,* probably on the basis of its ten calyx glands and subulate styles. He did not comment on its peculiarities, such as the alternate estipulate leaves, the leaf glands (never found in *Byrsonima*), and the perigynous flowers, although the floral cup is clearly illustrated in his plate (Fig. 1). However, his choice of the epithet *dispar* (unlike, unequal) may have indicated an awareness that this was a most peculiar *Byrsonima* (alternatively, it may have simply referred to the leaves, which he described as "saepe inaequilatera"). In any case, *Barnebya* does seem likely to be fairly close to the subfamily Byrsonimoideae, which Anderson (1978) has characterized as a group of trees and shrubs with subulate styles, tricolporate pollen, the fruit never winged, and the inflorescence in the more primitive members comprising a raceme of cincinni. The subfamily is a discrete, wholly neotropical group, very probably representing the ancestral plexus of the family, without clear intermediates to the often twining, often samara-bearing genera with complex pollen, which represent the bulk of the family. In these derived genera the cincinnus, the basic unit of the byrsonimoid inflorescence, is invariably reduced to a single flower (as is also the case in many byrsonimoids). Thus the primitive inflorescence of *Barnebya,* with its racemes of several-flowered cincinni, is a compelling indicator of relationship to the Byrsonimoideae. The subulate styles and presence of glands on all five sepals also accord well with the Byrsonimoideae. The pollen, with three equatorial pores, is surely derived from the byrsonimoid tricolporate grain by loss of the colpi (S. R. Lowrie, pers. comm.). For all these reasons we are convinced that *Barnebya* represents an evolutionary line that is derived directly from the Byrsonimoideae, divergent in its alternate estipulate leaves, perigynous flowers, loss of colpi in the pollen, and acquisition of wings on the mericarps. The samaras are especially interesting; this is the only neotropical genus known with byrsonimoid characteristics and winged fruits. While *Barnebya* would be a poor candidate for the ancestry of the large samara-bearing genera like *Banisteriopsis,* it can reasonably be considered a derived relict of the group that must have once existed to bridge the gap between the Byrsonimoideae and the rest of the family. If one wished to identify the tribe within the Byrsonimoideae to which *Barnebya* is most similar, we would have to suggest the tribe Galphimieae as restricted by Anderson (1978), because of the

connate carpels and schizocarpic fruits; however, we are not advocating the assignment of *Barnebya* to the Galphimieae nor even to the Byrsonimoideae at this time. Wherever it is placed, *Barnebya* must be kept near its close relative *Acridocarpus* (see below). If placed in the Byrsonimoideae, these two genera would surely merit their own tribe. It also seems possible that they will eventually be considered sufficiently isolated to deserve their own subfamily. We prefer to leave that matter unsettled for now, pending further progress in ongoing studies of the infrafamilial classification of the Malpighiaceae.

Niedenzu transferred *Barnebya dispar* to *Banisteria,* which is now properly called *Banisteriopsis*. There is indeed a strong resemblance between the samaras of *Barnebya* and *Banisteriopsis,* and *Banisteriopsis* is certainly the only New World genus to which *B. dispar* could possibly be assigned. However, on the basis of a recently completed revision of *Banisteriopsis* (Gates, in press), we assert with some confidence that the resemblance between the two genera is limited to their samaras and even that similarity does not extend past the shape of the dorsal wing. Their other characteristics show that these genera are not closely related. *Barnebya* may be derived from the evolutionary line that eventually produced *Banisteriopsis,* but it is also quite possible that their similar samaras resulted from parallel evolution, which seems to have been quite common in the Malpighiaceae. The differences between *Barnebya* and *Banisteriopsis* are summarized in the following couplet:

1 Inflorescence composed of several-flowered cincinni with long slender peduncles; calyx, corolla, and androecium perigynous; calyx bearing 10 glands, 2 on each sepal; tufts of basifixed hairs present at base of sepals adjacent to filaments; filaments free from each other; pollen oblate, with 3 (–5) equatorial pores and no colpi; styles subulate, with tiny stigmas; nut of the samara without a basal-dorsal carpophore, with a high, wide, ovate ventral areole, finally attached to the receptacle by 2 coriaceous ribs at the margin of the ventral areole; leaves alternate, estipulate, with impressed glands in the lamina ..... *Barnebya*

1 Inflorescence composed of 1-flowered units, the peduncle very short or, usually, completely suppressed; calyx, corolla, and androecium hypogynous; calyx usually bearing only 8 glands, on the 4 lateral sepals; hairs absent between sepals and filaments; filaments basally connate; pollen cuboidal, with non-equatorial pores and furrows; styles not tapering distally, truncate or capitate with large stigmas; nut of the samara with a basal-dorsal carpophore, the area of attachment to the torus small and circular, lacking marginal ribs; leaves usually opposite or whorled, with interpetiolar stipules, the glands on the lamina usually raised ..... *Banisteriopsis*

We believe that *Barnebya* is actually most closely related to *Acridocarpus,* which is a paleotropical genus of about 25 species, most of them African but with two species reported from Madagascar, one from Socotra, one from Arabia, and one from New Caledonia (Niedenzu, 1928). The two genera share these similarities: alternate leaves with impressed glands on the lamina, no glands on the petiole, and stipules none or (in some species of *Acridocarpus*) minute at the base of the petiole; filaments free from each other; pollen directly derivable from the byrsonimoid tricolporate type; subulate styles; samaras identical in all respects except for the absence in *Acridocarpus* of the ribs that separate from the margin of the ventral areole in *Barnebya*. The differences between *Barnebya* and *Acridocarpus* are summarized in the following couplet:

1 Inflorescences terminal only, composed of several-flowered cincinni with long slender peduncles; calyx, corolla, and androecium perigynous; calyx bearing 10 large, decurrent glands; tufts of basifixed hairs present at base of sepals adjacent to filaments; anthers with longitudinal dehiscence; pollen triporate, without colpi; all 3 styles ± equally well developed; styles straight or bent only at the tip, exserted only 1.5 mm or less beyond the anthers; samara finally attached to the receptacle by 2 coriaceous ribs at margin of ventral areole ..... *Barnebya*

1 Inflorescences terminal and lateral, composed of 1-flowered units, the peduncle very short

2.

BYRSONIMA dispar.

or, usually, completely suppressed; calyx, corolla, and androecium hypogynous; calyx glands few and small to completely lost; hairs absent between sepals and filaments; anthers dehiscing by oblique apical pores; pollen syntricolporate; only 2 styles developed; styles circinate in bud and remaining strongly curved in anthesis, exserted far beyond the anthers; samaras lacking ribs on margin of ventral areole ---------- *Acridocarpus*

For most of these differences we consider *Barnebya* more primitive than *Acridocarpus,* although its perigynous perianth is probably derived and the pollen in both genera must have been independently derived from a tricolporate ancestor, through loss of the colpi in *Barnebya* and extension and fusion of the colpi in *Acridocarpus*. The latter phenomenon is especially interesting because the same tendency can be seen in *Galphimia* and *Verrucularia,* two genera of the Galphimieae, the tribe of Byrsonimoideae most like *Barnebya* (S. R. Lowrie, pers. comm.). Several of the most notable characteristics in *Acridocarpus* are related to a probable shift in the method of pollination. These are the large anthers dehiscing by apical pores and the elongated, curved styles held well above the flower. Together with the loss of the calyx glands and the absence of oil bees from the Old World (Anderson, 1979), these features suggest that *Acridocarpus* has shifted to "buzz pollination," in which the abundant pollen is removed from the anthers by the vibrations of bees grasping the stamens while their bodies are poised above the flower where the stigmas are held ready to be pollinated. This mode of pollination is described in detail by Buchmann and Hurley (1978). Some such shift away from the primitive oil-bee syndrome of *Barnebya* and most other neotropical Malpighiaceae must have occurred in each line of paleotropical Malpighiaceae, all of which probably offer pollen as the only reward for pollinators (Anderson, 1979). However, as far as we know the evolution of apical pores in the anthers has occurred only twice in the Old World, once in *Acridocarpus* (including the small segregate genus *Rhinopterys*) and once in the genus *Tristellateia*. A similar adaptation for "buzz pollination" is also found in the rare neotropical byrsonimoid genus *Coleostachys*.

We conclude that *Barnebya* is a link between the Byrsonimoideae and the more advanced Malpighiaceae, representing an almost direct ancestor to *Acridocarpus* and an analogue of the missing intermediates between the byrsonimoids and *Banisteriopsis* and its relatives.

Key to the species of *Barnebya*

1 Anthers glabrous, 0.7–2.1 mm long; petioles (7) 10–22 mm long, soon glabrate; lamina flat, not or hardly revolute at the margin, mostly acute or short-acuminate at the apex, quite glabrate at maturity; inflorescence hairs straight, appressed; 4 lateral petals dimorphic, the outermost deeply concave, the other 3 nearly flat and obovate, more like the posterior petal; filaments 1.2–1.5 mm long; perigynous cup glabrous on inner face opposite ovary; styles 2.5–3 mm long, straight in bud; ovary tightly sericeous; samara (45) 52–65 mm long ---------- 1. *B. dispar*

1 Anthers loosely sericeous, 2–2.5 mm long; petioles 2–3 mm long, persistently sericeous or eventually glabrescent on the distal ½; lamina bullate, revolute at the margin, mostly obtuse or rounded at the apex, with some hairs usually persistent on the abaxial midrib

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FIG. 1. *Barnebya dispar*. Flowering branch, ×0.5. 1. Flower, ×2. D. Diagram of flower. 2. Flower buds, left ×0.5, middle ×1.6, right longitudinal section ×3. 3. Longitudinal section of flower with petals and gynoecium removed, ×3. 4. Sepal, adaxial side, ×5. 7. Petal, ×3. 9. Stamens, lateral view (left) and abaxial view (right), ×3. 12. Anther in cross section, ×4. 13. Stamen with open anther, ×3. 14. Pollen, ×60. 17. Carpel, longitudinal section, ×5. 18. Gynoecium, ×5. 21. Ovule, ×7. Reduced ca 50% from Tabula 2, *Byrsonima dispar,* Malpighiaceae by A. H. R. Grisebach in Martius, Flora Brasiliensis 12(1). 1858.

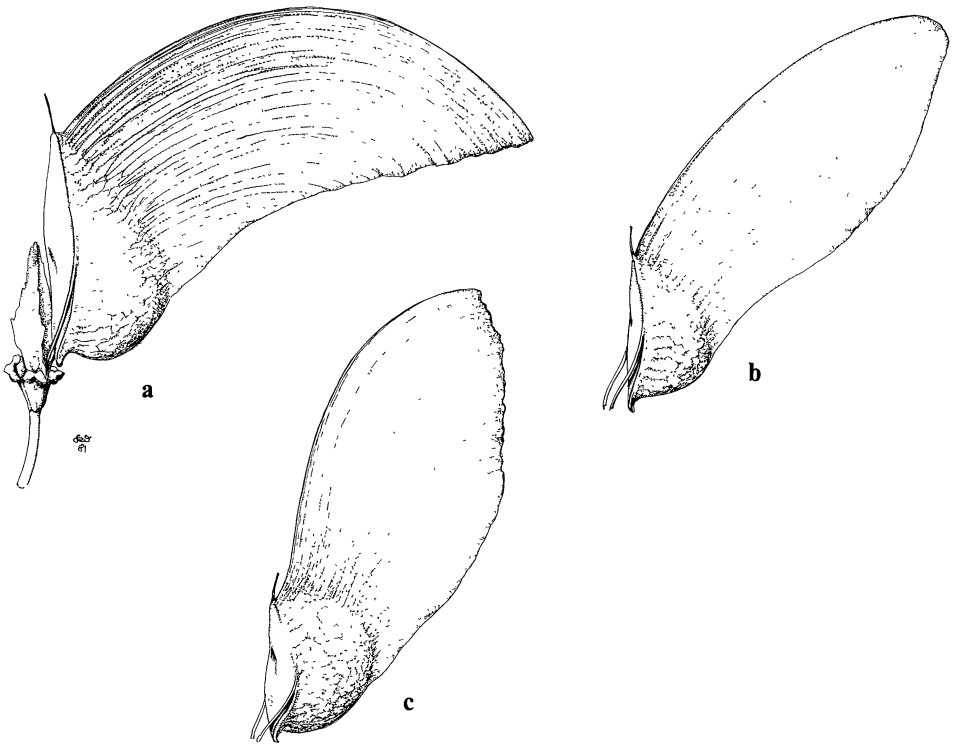

FIG. 2. Samaras of *Barnebya dispar*, all ×1. A. RB 26346, still attached to receptacle by coriaceous ribs. B. *Pinheiro 1542*. C. *Riedel 359*. Drawn by Karin Douthit.

at maturity; inflorescence hairs loose; 4 lateral petals subequal; filaments 2.5 mm long; perigynous cup sericeous on inner face opposite ovary; styles 4 mm long, the distal 0.5 mm bent inward in bud; ovary loosely sericeous; samara 39–43 mm long ..... 2. *B. harleyi*

1. **Barnebya dispar** (Grisebach) W. Anderson & B. Gates, comb. nov. (Figs. 1–2)

Byrsonima dispar Grisebach in Martius, Fl. Bras. 12(1): 10 & Fig. 2. 1858. TYPE: BRAZIL. RIO DE JANEIRO: in silvis prope Mandiocca, Jan/Feb 1823 (fl), *Karwinski* (HOLOTYPE: BR!). *Banisteria dispar* (Grisebach) Niedenzu, Verz. Vorles. Akad. Braunsberg W.-S. 1912–1913: 13. 1912.

Trees 5–12 m tall or woody vines; vegetative stems initially sericeous, soon glabrate, eventually forming punctate or somewhat elongated lenticels. Lamina of the larger leaves (8) 11–25 cm long, (3) 4.5–10 cm wide, obovate to nearly elliptical, attenuate and somewhat decurrent at the base, flat or very slightly revolute at the margin, short-acuminate or acute or occasionally obtuse or rounded at the apex, plane, with the veins and reticulum prominent on both sides, probably initially sericeous, at least on the midrib below, but quite glabrate at maturity, bearing typically 2 glands near the base and 2 in the distal ⅓ between the midrib and margin but sometimes 0 or 4 in either area; petiole (7) 10–22 mm long, initially sericeous but soon nearly or quite glabrate. Inflorescence (including peduncles and pedicels) thinly sericeous to eventually glabrescent; bracts 2–4.5 mm long, triangular to subulate, eglandular, often deciduous in anthesis and usually deciduous before maturation of the fruit; primary peduncle (from inflorescence axis to first joint) (5) 10–27 mm long; bracteoles 1–2.5 mm long, ovate to triangular, eglandular or abaxially callose at the base, often deciduous before

maturation of the fruit; pedicel 7–20 mm long. Calyx glands 3.5–6 mm long, with ca 3 mm on the calyx and 0.5–3 mm decurrent on the pedicel, glabrous; sepals beyond glands 1.5–2 mm long, 1.5–2.5 mm wide. Petals glabrous or with a few hairs at base of claw; outermost petal (one of the antero-lateral pair) with the limb 6.2–7.5 mm long and wide, deeply concave, the margin mostly erose and membranous; other 3 lateral petals with the limb 4–5.5 mm long, 3–4 mm wide, obovate and somewhat concave to flat, the margin ± bluntly dentate and eglandular or more often glandular-thickened; posterior petal with the claw thicker, the limb 4–5.5 mm long, 2.5–3.5 mm wide, obovate and flat, the margin dissected with the rounded segments glandular-thickened all around or at least in the proximal ½. Filaments 1.2–1.5 mm long; anthers 1.5–2.1 mm long opposite the sepals, 0.7–1.5 mm long opposite the petals, glabrous. Perigynous cup glabrous on the inner face opposite the ovary. Ovary 2–2.5 mm high, very tightly sericeous; styles 2.5–3 mm long, straight in bud, slightly spreading in anthesis, stout, narrowing abruptly at the apex, with the stigma distinctly internal. Samara (45) 52–65 mm long, thinly sericeous to glabrate; nut 16–25 mm long, 9–11 mm wide, the ventral areole 16–25 mm high, 7–10 mm wide, ovate; dorsal wing (27) 34–50 mm long, 17–23 mm wide, flabellate to elliptical to falcate. Torus 8–12 mm high.

Other collections examined: BRAZIL. BAHIA: Rod. 36 a Itaju, plantação de capim, 3 Aug 1971 (fr), *Pinheiro 1542* (MICH). RIO DE JANEIRO: Arboretum do Horto Florestal, 27 Jan 1941 (fl), *Almeida s. n.* (RB 994); 2 Feb 1918 (fl), *Dionisio 1739* (MICH, RB 11679); Matta da Fabrica Aliança, Larangeiras, 29 Nov 1927 (fr), *J. G. Kuhlmann* (RB 979); mata primária, Serra dos Órgãos, Feb 1974 (fr), *Occhioni 5875* (MICH); in sylv. mont. Macahé, May 1832 (fr), *Riedel 359* (LE); Macahé (fl), *Riedel & Langsdorff 396* (LE); *Riedel & Langsdorff 807* (LE); in sylvis umbrosis pr. Mandiocca, Dec 1822 (fl), *Riedel & Langsdorff* (LE); in sylv. umbr. Mand., Jan 1824 (fl), *Riedel & Langsdorff* (LE); Arboretum arv. no. 285, sine coll. (MICH, RB 150325); Estrada da Vista Chinesa, perto do Horto Florestal, 10 Jan 1928 (fl/fr), sine coll. (MICH, RB 150328), 18 Jan 1928 (fl/fr), sine coll. (MICH, NY, RB 1137, RB 26346), 4 Feb 1942 (fl), sine coll. (RB 47517). São Paulo: Cubatão, 15 May 1957 (fl), *M. Kuhlmann 4079* (SP).

As the above citations show, almost all collections of this species come from the small state of Rio de Janeiro, and the habitat in Rio if described is always a moist, shady forest. The collection from Cubatão in São Paulo is an interesting but not very surprising extension, because the same forest flora found in the Serra dos Órgãos continues down the Serra do Mar in São Paulo. More surprising and interesting is the single collection from Bahia, which according to Mori and Silva (1979) is from a locality at approximately 15°S, 40°W, quite far from the nearest locality and in an area with mesophytic rather than wet forest. This recent collection suggests that this rare species may have also grown in the wet forests of Espírito Santo before they were destroyed.

For all but two collections in which habit was noted this species was called a tree. The two exceptions were *Pinheiro 1542* ("trepadeira," i.e., climber) and *Occhioni 5875* ("arbusto escandente," i.e., scandent shrub). Those two collections are not morphologically separable in other respects from *B. dispar,* so we shall reserve judgement on the significance of this apparent difference until the accuracy of the observations has been verified.

This species is quite variable in the size and shape of its leaves and samaras and in the branching of the inflorescence, which can comprise a single main axis or a main axis with few to many shorter lateral axes arising near its base. We are unable to discern separable entities in which variations are consistently correlated, so we are recognizing a single species.

2. **Barnebya harleyi** W. Anderson & B. Gates, sp. nov. (Fig. 3)

Liana lignosa; lamina foliorum bullata, margine revoluta, apice plerumque obtusa vel rotundata, pilis plerumque persistentibus in costa abaxiali; petiolus 2–3 mm longus, pertinaciter sericeus vel

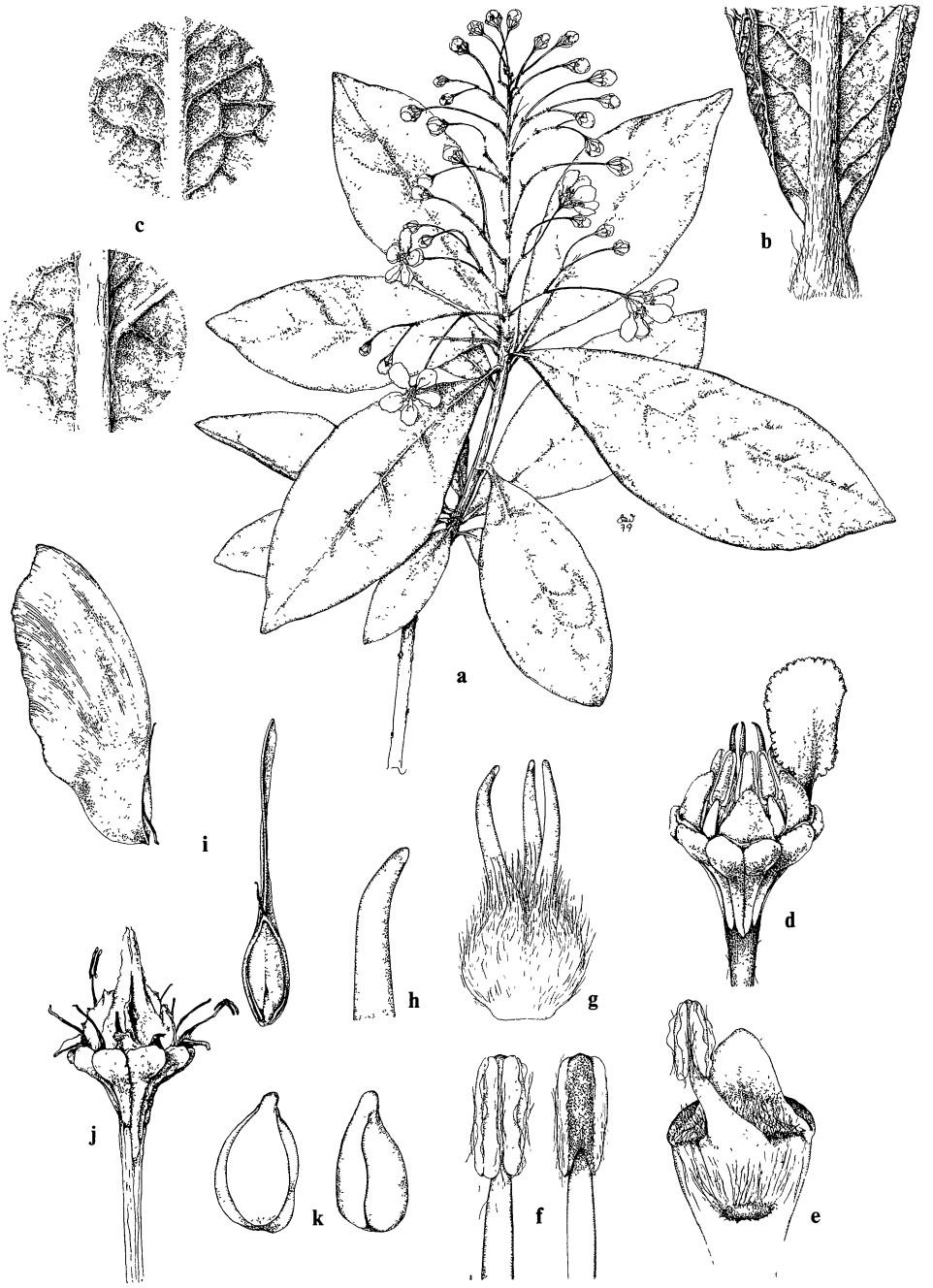

FIG. 3. *Barnebya harleyi*. A. Flowering branch, ×0.5. B. Leaf base with complete petiole, ×5. C. Detail of leaf surfaces, adaxial (above) and abaxial (below), ×10. D. Flower with lateral petals removed, the flag (posterior) petal present, ×2.5. E. Portion of flower with gynoecium removed to show perigynous cup, ×5. F. Anthers, ×7.5. G. Gynoecium, ×5. H. Distal portion of style and stigma, ×10. I. Samaras, side view (left) and adaxial view to show ventral areole (right), ×1. J. Old flower with torus after loss of samaras, ×2.5. K. Embryos, ×1.5. Drawn from the type by Karin Douthit.

demum glabrescens in dimidio distali; inflorescentia pilis laxis; 4 petala lateralia subaequalia; filamenta 2.5 mm longa; antherae 2–2.5 mm longae, laxe sericeae; styli 4 mm longi, distaliter inflexi in alabastro; ovarium laxe sericeum; samara 39–43 mm longa.

Woody vines to 8 m; vegetative stems densely sericeous to soon glabrate, punctate-lenticellate. Lamina of the larger leaves 7.5–10.5 cm long, 3.5–4.6 cm wide, obovate or elliptical, attenuate or cuneate at the base, revolute at the margin, rounded or obtuse at the apex or very abruptly slightly acuminate, bullate, with the veins and reticulum white and prominent on both sides, thinly sericeous to glabrate on both sides with some hairs usually persistent on the abaxial midrib, bearing 2–4 small ill-defined glands proximally near the midrib and 2–4 distally between the midrib and margin; petiole 2–3 mm long, densely and ± persistently sericeous or eventually glabrescent on the distal ½. Inflorescence tomentose or loosely sericeous and eventually glabrescent; bracts and bracteoles 1–2.7 mm long, narrowly triangular or subulate, eglandular, caducous or soon deciduous, the bracteoles borne slightly to distinctly below the joint; primary peduncle (from inflorescence axis to first joint) 4–14 mm long, loosely sericeous; pedicel 20–25 mm long, thinly sericeous and glabrescent. Calyx glands 5–6 mm long, with ca 3.5–4 mm on the calyx and 1–2 mm decurrent on the pedicel, pilose on the margins; sepals beyond glands 2 mm long and wide. Petals glabrous or thinly sericeous abaxially on the claw; lateral petals with the limb 6.5–8.5 mm long, 6–8 mm wide, deeply concave (outermost) to moderately concave, erose or subentire with the margin mostly slightly glandular-thickened or the outermost with the margin membranous; posterior petal with the claw thicker, the limb 6 mm long, 4.5 mm wide, obovate and flat, the margin dissected with the rounded segments largest at the base and smaller distally, all distinctly glandular-thickened. Filaments 2.5 mm long; anthers 2.3–2.5 mm long opposite the sepals, 2.0 mm long opposite the petals, the locules loosely sericeous. Perigynous cup sericeous on the inner face opposite the ovary, the hairs medifixed. Ovary 3.5 mm high, loosely sericeous; styles 4 mm long, with the distal 0.5 mm bent inward in bud and partly straightened in anthesis, slender, tapering gradually distally, with the stigma nearly apical. Samara 39–43 mm long, puberulent on the nut, distally glabrous at maturity; nut 15 mm long, 9–10 mm wide, the ventral areole 14–15 mm high, 5–6 mm wide, narrowly ovate; dorsal wing 25–30 mm long, 15 mm wide, roughly elliptical, the adaxial margin recurved, the abaxial ± straight or curved upwards. Torus 6 mm high.

TYPE: BRAZIL. BAHIA: 3 km NW of Lagoinha (5.5 km SW of Delfino) on side road to Minas do Mimoso, cut over woodland, elev. ca 640 m, approx. 41°16′W, 10°27′S, 5 Mar 1974 (fl/fr), *R. M. Harley 16750* (HOLOTYPE: CEPEC; ISOTYPE: MICH).

This species is known only from the type. It is named in honor of the collector of the type, Dr. Raymond M. Harley of Kew, in recognition of his contribution to our knowledge of the flora of Bahia.

The morphological differences between *B. harleyi* and *B. dispar* are summarized in the key above. In addition, the usual habitat of *B. dispar* is wet forest, very different from the dry woodland near Lagoinha. However, as noted under *B. dispar,* there is some evidence that that species can grow in somewhat drier areas.

Acknowledgments

We are grateful to Stuart R. Lowrie for sharing with us his unpublished observations and thoughts on the pollen of Malpighiaceae. Dr. Stephen L. Buchmann educated W. R. Anderson about the significance of apical pores in anthers

and their presence in *Acridocarpus,* for which we thank him. We also thank the curators of the following herbaria for lending or donating the specimens that formed the basis for our study: BR, CEPEC, K, LE, NY, RB, RFA, SP.

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