Five new species of Heteropterys (Malpighiaceae) from Central and South America

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Amorim, A. M. (Departamento de Ciências Biológicas, Universidade Estadual de Santa Cruz, Ilhéus, 45.650–000, Bahia, Brazil; email: aamorimm@terra.com.br). Five new species of *Heteropterys* (Malpighiaceae) from Central and South America. Brittonia 54: 217–232. 2002.—Five new taxa of *Heteropterys* H. B. K. subsect. *Aptychia* Nied. are described, illustrated, and mapped: **H. andina** from Peru; **H. minutiflora** from Costa Rica; and **H. bullata**, **H. capixaba**, and **H. oberdanii**, from the Atlantic coastal forest of Brazil. The affinities and diagnostic characters of each species are discussed.

Key words: Malpighiaceae, *Heteropterys*, *Aptychia*, South America, Central America, systematics.

Amorim, A. M. (Departamento de Ciências Biológicas, Universidade Estadual de Santa Cruz, Ilhéus, 45.650–000, Bahia, Brazil; email: aamorimm@terra.com.br). Five new species of *Heteropterys* (Malpighiaceae) from Central and South America. Brittonia 54: 217–232. 2002.—Cinco taxa de *Heteropterys* H. B. K. subsect. *Aptychia* Nied. são descritas como novas, ilustradas e mapeadas: **H. andina** do Peru; **H. minutiflora** da Costa Rica; e **H. bullata**, **H. capixaba** e **H. oberdanii**, da Floresta Atlântica no Brasil. São apontadas as afinidades e os caracteres diagnósticos de cada espécie.

Heteropterys is a neotropical genus of the Malpighiaceae with approximately 130 species. It is primarily characterized by a schizocarpic samara in which the dorsal wing is dominant and has a thickened abaxial edge and the lateral wings are reduced to crests or are absent. In molecular studies (Cameron et al., 2001; Davis et al., 2001), the genus appears to be a well-placed member of "hiraeoids/tetrapteroids" lineage, which basically contains plants with samaras having dominant lateral wings and a reduced or lost dorsal wing.

The most recent taxonomic revision of *Heteropterys* is more than 74 years old (Niedenzu, 1928). Since then, eleven additional species belonging or related to subsect. *Aptychia* have been published (Amorim, 2001; Anderson, 1981, 1982, 1997; Cuatrecasas, 1958). The species of subsect. *Aptychia* are easily recognized by their flowers with sessile pedicels (defined according to the conventions of terminology for the Malpighiaceae, in Anderson, 1981, 2001) and are most diverse in the Atlantic coastal forest of Brazil and northern South America, with one species occurring in Central America.

Recent fieldwork in Bahia and Espírito Santo, Brazil, and a careful examination of important herbaria collections has revealed five new species of *Heteropterys* subsect. *Aptychia*. The description of so many new species of *Heteropterys* results from previous lack of collections. The taxonomy of this genus is far from satisfactory because many species occur in inaccessible locations (especially in rain forest canopies), and because of their great vegetative variability. These discoveries confirm the opinion of Prance (2001) about the importance of increasing the collecting effort to find rare species in the megadiverse countries of the tropics.

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Heteropterys andina Amorim, sp. nov. (Fig. 1)

TYPE: PERU. Cuzco: Mun. Cuzco, Dist. Camisea, Campamento Armihuari, Camisea Production Unit, surrounding camp, 11°51′48″S, 72°46′44″W, 469 m, 28 Jan 1997 (fl), *P. Acevedo-Rodriguez (with D. Bell, K. Rankin & F. S. Smith) 9268* (HOLOTYPE: US; ISOTYPE: USM—n.v.).

Liana, ramis mox glabrescentibus. Lamina foliorum majorum 3.9–10.7 cm longa, 1.8–4.7 cm lata, membranacea, elliptica, late lanceolata, ovata, ovato-lanceolata vel ovato-cordata, glabrescens, marginibus integris; petiolus 7–15 mm longus, basi biglandulifer. Panicula 9–13.2 cm longa, laxa, deflexa, umbellis 3–4-floris, pedunculo florifero nullo, pedicellis 6–7 mm longis. Petala lutea, in alabastro exposita, valde reflexa; stamina glabra, connectivis nigrescentibus; styli arcuati, 2 stylis posticis in apice dorsaliter rotundatis, stylo antico in apice dorsaliter brevi-apiculato truncato.

Liana, climbing to 8 m; *stems* cylindrical, striate, soon glabrate, developing small scattered lenticels. *Leaves* opposite; petiole 7–15 mm long, glabrate, bearing a pair of impressed glands at base, each gland ca. 1 mm diam.; stipules not seen; lamina of larger leaves (3.9–)5.5–10.7 × (1.8–)2.3–4.7 cm, membranous, elliptical, ovate, broadly lanceolate, ovate-lanceolate or occasionally ovate-cordate to obovate-oblong, the base obtuse to cuneate or slightly cordate, the apex acute or acuminate to obtuse, the margins entire, the surfaces (both?) initially sparsely sericeous becoming glabrate at maturity, the abaxial surface bearing many small impressed glands midway between margin and midrib, with lateral veins and reticulum visible. *Inflorescence* paniculate, open, terminal or axillary, pendulous, sericeous to glabrate, 9–13.2 cm long; primary branches 8–16, 0.5–6.2 cm long; secondary branches 6–8, 0.2–0.5 cm long; ultimate units in 3–4-flowered umbels, occasionally with an additional pair of flowers borne more proximally; inflorescence bracts 1.7–1.9 × 1 mm, linear-lanceolate, the margins entire and eglandular; peduncle absent; floral bracts ca. 0.5 × 0.4 mm, ovate, eglandular, sericeous abaxially, glabrous adaxially; bracteoles like bracts but smaller, eglandular; pedicel 6–7 × 0.6–1.5 mm, sericeous, straight. *Sepals* 2–2.6 × 1.3 mm, rounded at apex, appressed in anthesis, sericeous abaxially, glabrous adaxially, eglandular or the anterior sepal eglandular and the lateral 4 biglandular, the glands ca. 1.1 mm long, elliptical or orbicular. *Petals* exposed in the enlarging bud, presumably yellow, glabrous, slightly erose at margin, smooth abaxially, all 5 reflexed in anthesis, often deciduous; lateral petals with claw 1.5–1.6 mm long, limb 1.5–1.7 × 1.3 mm; posterior petal with claw ca. 1.7 mm long, limb 1.5 × 1–1.2 mm. *Stamens* glabrous, unequal; filaments 1.4–2.1 × 0.1–0.6 mm, connate ca. ½ their length; anthers 0.5–0.7 mm long, all alike, glabrous, erect to reflexed, the connective uniformly black. *Ovary* 1.2–1.4 mm high, densely sericeous; styles 1.7–1.9 mm long, equaling or slightly exceeding anthers, glabrous; anterior style straight, the apex truncate and short-apiculate dorsally; 2 posterior styles divergent or arcuate-ascending at middle and then bending inward distally, the apex rounded; stigmas internal, all 3 facing center of flower. *Fruit* unknown.

Distribution and habitat.—Tropical and subtropical lowland, premontane and montane forests of Peru (Young & León, 1997), between 400 and 750 m (Fig. 2). Probably endemic.

Etymology.—The specific epithet refers to its occurrence on the slopes of the Peruvian Andes.

Phenology.—Flowering in January and February.

Additional specimens examined: PERU. Unknown locality. 1839–1840 (imm. fl), *Gay* [probably *175*] (P). **Cuzco**: Prov. La Convención, Alto Urubamba, Río Manguyari, 12°47′S, 72°40′W, 3 Feb 1989 (old fl), *Núñez et al. 10103* (MICH, MO), 2 Feb 1991 (old fl), *Núñez et al. 12727* (MICH, MO).

Heteropterys andina is probably most closely related to *H. occidentalis* Cuatrec. from Vale del Rio Cauca and Nariño in Colombia, and *H. berteroana* Adr. Juss. from the Caribbean coast of northern Colombia and northwestern Venezuela. Both of those species have leaf surfaces that are quite glabrate at maturity; many small impressed glands midway between margin and midrib below; lateral petals that are reflexed and abaxially smooth; sepals, petals, and filaments that are similar in size; and a uni-

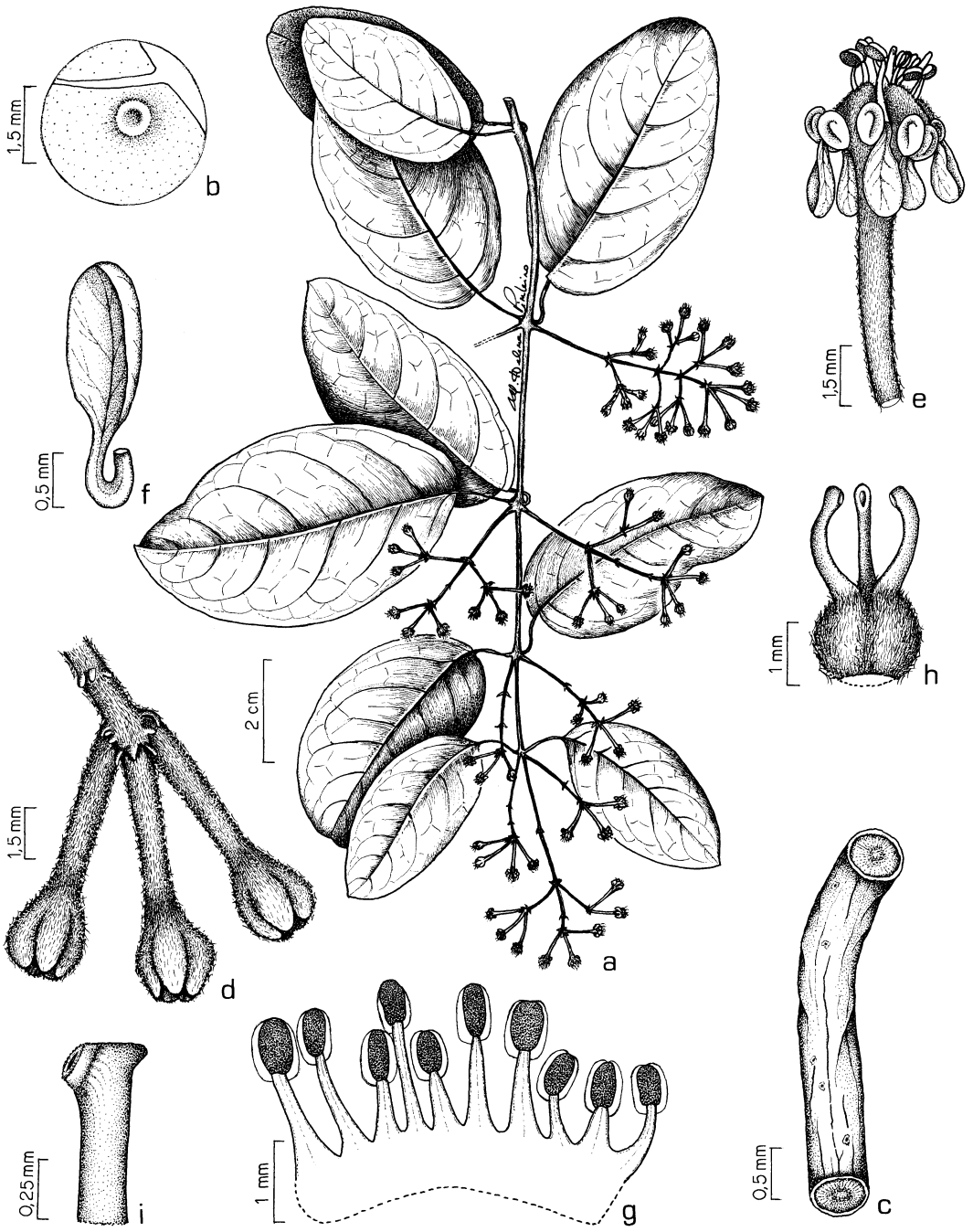

FIG. 1. *Heteropterys andina*. **A**. Flowering branch. **B.** Detail of abaxial surface of lamina. **C**. Detail of basal stem. **D.** Umbel of flower buds, with one removed. **E**. Flower. **F.** Lateral petal. **G.** Androecium, laid out, abaxial view: stamen second from right occurs opposite posterior petal; stamen fourth from left occurs opposite anterior sepal. **H.** Gynoecium, showing anterior style in middle. **I.** Detail of apex of anterior style. (a, b, d–i from the holotype, *Acevedo-Rodriguez et al. 9268,* US; c from *Núñez et al. 10103,* MICH.)

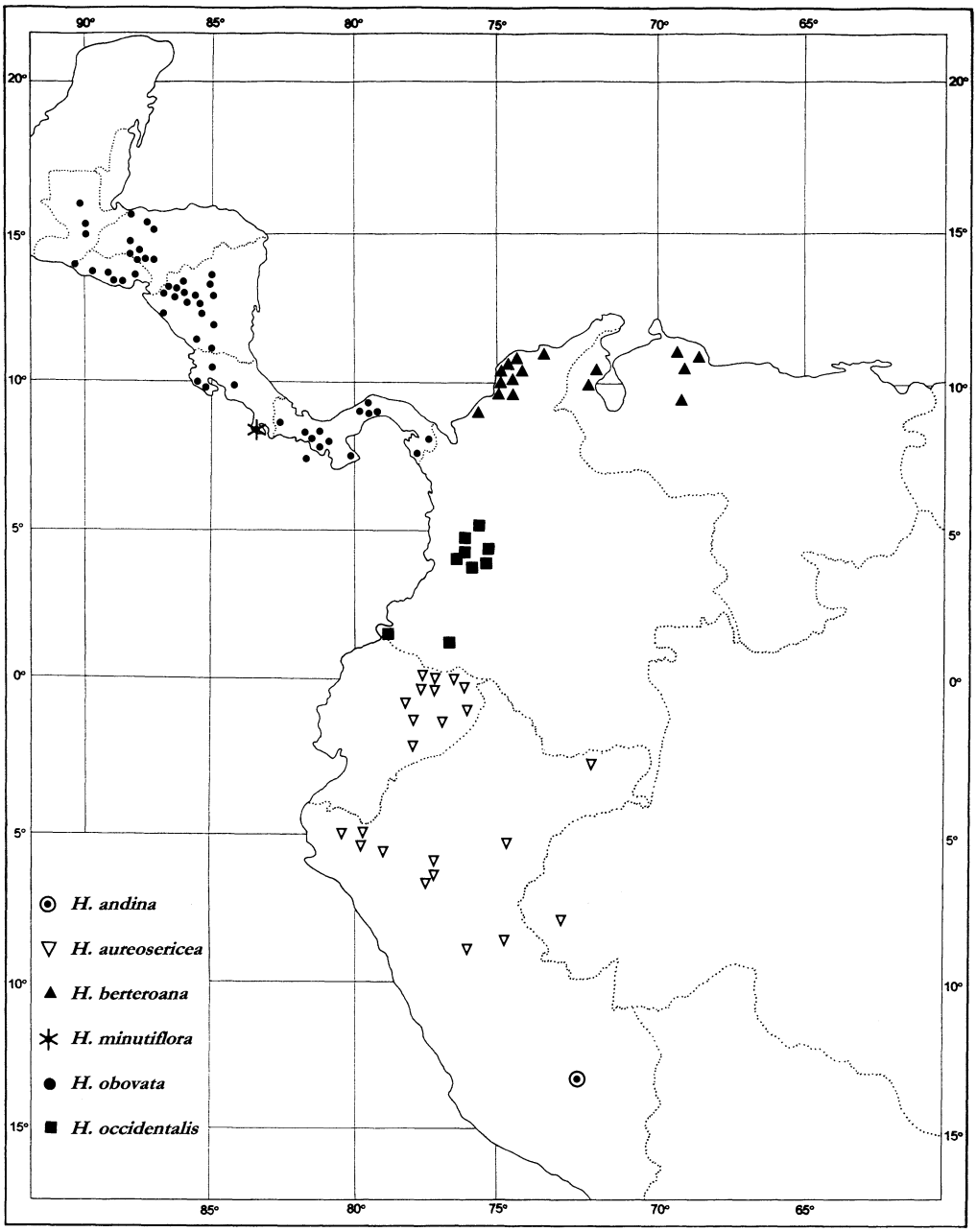

FIG. 2. Distribution of selected species of *Heteropterys* subsect. *Aptychia* in Central America and northern South America.

formly black connective. *Heteropterys occidentalis* is distinguished from *H. andina* in its strongly erose petal margins, pubescent anthers, and style shape. *Heteropterys berteroana* differs from *H. andina* in having flowers borne ultimately in elongated pseudoracemes, longer pedicels (9–16 mm long), triangular bracts (ca. 1.4 mm long), an erect posterior petal, anthers with locules usually shorter than the extension of the connective, and straight styles. *Heteropterys andina* is distinctive in its open inflores-

cence, straight pedicel, small petals (all five strongly reflexed in anthesis), and arcuate-ascending styles. When more specimens, especially fruiting collections, of *H. andina* become available, it might be possible to find additional differences that will further clarify these relationships.

Heteropterys minutiflora Amorim, sp. nov. (Fig. 3)

TYPE: COSTA RICA. Puntarenas: Cantón de Osa, cuenca superior de Quebrada Banegas, bajando hasta La Quebrada Digo-Digo, 8°42′N, 83°31′W, 350 m, 13 Jan 1991 (fl), *G. Herrera 4816* (HOLOTYPE: CR; ISOTYPES: CTES, F, MICH, MO).

Liana ramis teretibus, striatis, glabrescentibus. Lamina foliorum majorum 10–14.2 cm longa, 4–6.9 cm lata, elliptica, lanceolata, oblongo-lanceolata vel obovata, marginibus integris, subtus dense sericea; petiolus 7–10 mm longus, basi biglandulosus. Panicula 5–13 cm longa, flosculosa, deflexa, floribus 80–600, in umbellis congestis 4–8-floris dispositis, pedunculo florifero nullo, pedicello 0.3–0.7 mm diametro. Petala in alabastro exposita; stamina glabra, filamentis 0.9–1.6 mm longis, connectivo nigro; styli in apice dorsaliter rotundati; stylus anticus curvatus versus petalum posticum.

Liana; stems ca. 5 mm diam., cylindrical, strongly striate, twisted, soon glabrate; lenticels not seen. *Leaves* opposite; petiole 7–10 mm long, densely sericeous to eventually glabrate, bearing a pair of impressed glands at base, each gland ca. 0.8 mm diam.; stipules not seen; lamina of larger leaves 10–14.2 × 4–6.9 cm, membranous, elliptical, widely-lanceolate, oblong-lanceolate to sometimes obovate, the base acute to obtuse, the apex acute to obtuse or rarely acuminate, the adaxial surface sparsely sericeous to usually glabrous, the abaxial surface densely and persistently silvery-sericeous and bearing an irregular row of many small impressed glands midway between margin and midrib, the margins entire, the adaxial and abaxial surfaces with lateral veins visible and reticulum obscure. *Inflorescence* an elongated panicle, terminal or axillary, pendulous, densely sericeous, (5–)10–13 cm long, containing 80–400(–600) or more minute flowers; primary branches 4–20, 0.5–8 cm long; secondary branches 4–8, 0.2–0.6 cm long or absent; ultimate units in congested and dense 4–6(–8)-flowered umbels; inflorescence bracts ca. 4 × 0.9 mm, linear-lanceolate, the margins entire, the base biglandular, the glands 0.3–0.7 mm diam.; peduncle absent; floral bracts ca. 0.8 × 0.3 mm, ovate, eglandular, sericeous abaxially, glabrous adaxially; bracteoles similar to bracts but smaller, eglandular; pedicel 4.7–6 × 0.3–0.7 mm, densely sericeous, slender, slightly curved. *Sepals* ca. 1.2 × 0.8 mm, brown, rounded at apex, erect in anthesis, sericeous abaxially, glabrous adaxially, eglandular. *Petals* exposed in the enlarging bud, yellow, glabrous, slightly erose along margin, smooth abaxially, all 5 reflexed in anthesis or with posterior petal erect and laterals reflexed, persistent; lateral petals with claw ca. 1 mm long, limb 2.1–3.2 × 1.4–2.3 mm; posterior petal with claw ca. 1.3 mm long, limb ca. 3.2 × 1.6 mm. *Stamens* glabrous, unequal; filaments 0.9–1.6 × 0.1–0.3 mm, connate ca. 1/3 their length; anthers 0.6–0.8 mm long, all alike, glabrous, erect to reflexed, the connective uniformly black. *Ovary* ca. 1 mm high, densely sericeous; styles ca. 1.5 mm long, glabrous, equaling or slightly exceeding the anthers; anterior style nearly straight, inclined slightly toward posterior petal, the apex short-apiculate dorsally; 2 posterior styles strongly bowed, the apex rounded or truncate dorsally; stigmas internal, all 3 facing center of flower. *Fruit* unknown.

Distribution and habitat.—*Heteropterys minutiflora* is only known from Puntarenas, southern Costa Rica, between 30 and 500 m (Fig. 2). The vegetation of this region is mostly tropical lowland wet forest and tropical premontane wet forest (Herrera-MacBryde, 1997) and apparently contains a high number of endemic species, including some species of Malpighiaceae (e.g., *Bunchosia ursana* W. R. Anderson and *Dicella aciculifera* W. R. Anderson).

Etymology.—The specific epithet refers to the reduced flower size, the smallest that I know of in *Heteropterys*.

Phenology.—Flowering from November through January.

Additional specimens examined: COSTA RICA. **Puntarenas**: Reserva Biológica Carara, Sítio Tarcoli-

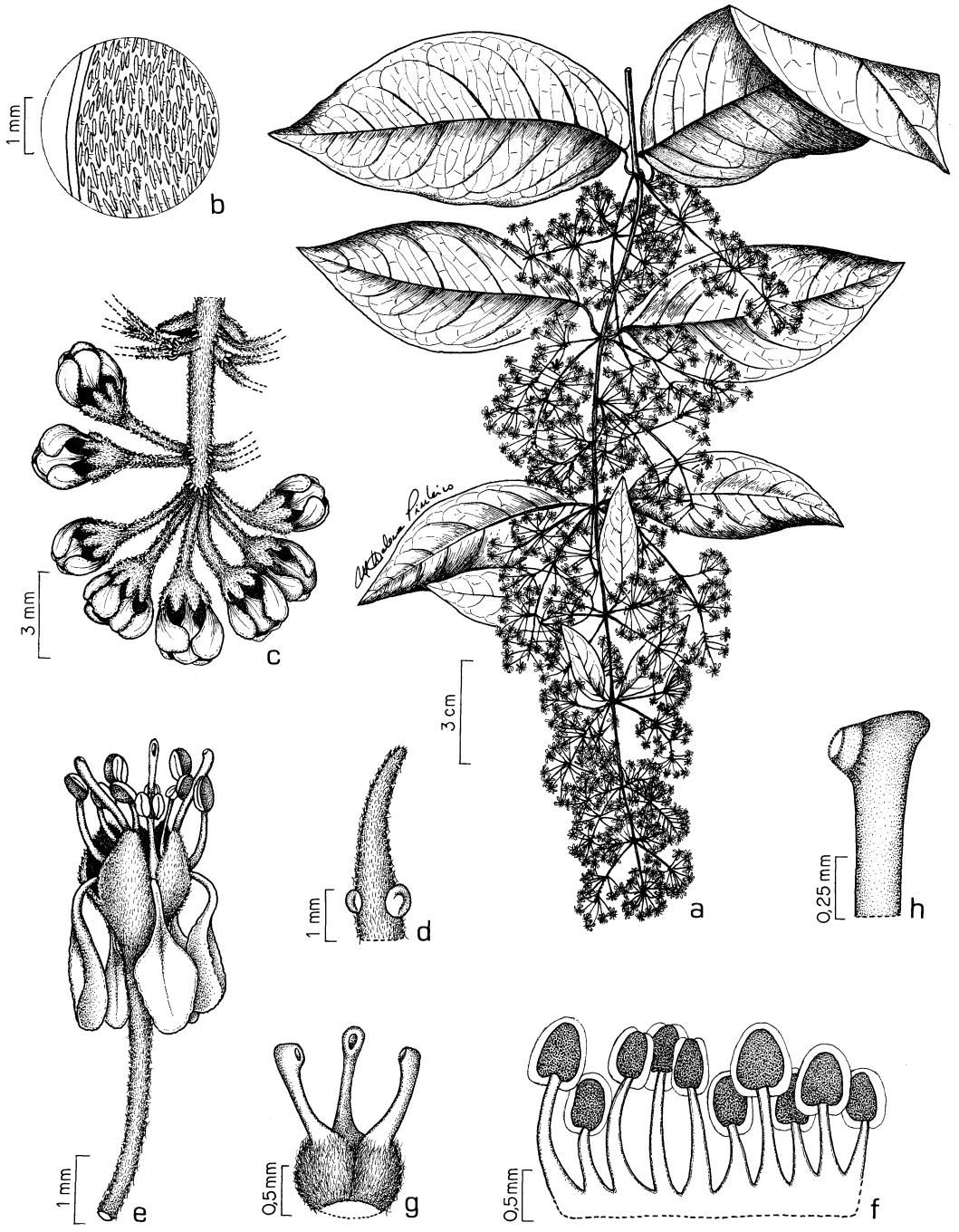

FIG. 3. *Heteropterys minutiflora*. **A.** Flowering branch. **B.** Detail of abaxial surface of lamina. **C.** Umbel of flower buds. **D.** Inflorescence bract. **E.** Flower. **F.** Androecium, laid out, abaxial view: stamen second from right occurs opposite posterior petal; stamen fourth from left occurs opposite anterior sepal. **G.** Gynoecium, showing anterior style in middle. **H.** Detail of apex of anterior style. (From the holotype, *Herrera 4816,* CR.)

tos, 09°45′30″N, 84°35′00″W, 21 Nov 1991 (imm. fl), *Zúñiga 539* (INB, MO); Reserva Florestal Golfo Dulce, entre Rincón y Chacarita, 08°46′N, 83°46′W, 29 Nov 1990 (imm. fl), *Hammel 17992* (CR, MICH, MO); Golfo Dulce, Río, Térraba, Dec 1947 (fl), *Skutch 5410* (US); Península de Osa, Parque Nacional Corcovado, Cantón de Golfito, 08°34′N, 83°31′W, 20 Dec 1993 (imm. fl), *Aguilar et al. 2783* (CMMEX, F, MO, NY).

The most distinctive features of this species are the small flowers, which are borne in congested, densely flowered umbels with 4–8 umbels per branch. *Heteropterys minutiflora* can be compared to *H. aureosericea* Cuatrec. and *H. obovata* (Small) Cuatrec. & Croat (including *Heteropterys petenensis* Lundell). In most characters, it resembles *H. obovata*, a polymorphic species found throughout Central America. Both species have leaves densely and persistently silvery-sericeous abaxially; all petals reflexed at anthesis or the posterior petal erect and the lateral petals reflexed; and styles that are rounded, truncate, or short-apiculate dorsally at the apex. The following couplet summarizes the more notable differences between the two.

1. Stems smooth or slightly fissured; pedicel 0.7–1.6 mm diam.; sepals 2.6–3.5 × 1.5–2.1 mm, apressed to filaments in anthesis; claw of posterior petal 2–2.6 mm long; filaments 1.5–3.5 mm long; ovary ca. 1.5 mm high; styles 2–2.2 mm long, the anterior one erect ..... *H. obovata*
1. Stems strongly striate: pedicel 0.3–0.7 mm diam.; sepals ca. 1.2 × 0.8 mm, erect in anthesis, claw of posterior petal ca. 1.3 mm long; filaments 0.9–1.6 mm long; ovary ca. 1 mm high; styles ca. 1.5 mm long, the anterior style inclined slightly toward posterior petal ..... *H. minutiflora*

Heteropterys bullata Amorim, sp. nov. (Fig. 4)

TYPE: BRAZIL. Bahia: Mun. Floresta Azul, BR 415 com entrada ca. 12 km da sede do município em ramal de acesso a torre de transmissão, 14°56′32″S, 39°41′56″W, 700 m, 12 Apr 2001 (fl), *J. G. Jardim (with S. C. Sant'Ana, J. L. da Paixão & B. R. Santos) 3440* (HOLOTYPE: CEPEC; ISOTYPE; SP).

Liana, ramis glabrescentibus. Lamina foliorum majorum 7.9–14.2 cm longa, 3.2–9.5 cm lata, oblonga, cordato-oblonga vel elliptica, bullata, basi cordata, glabrescens, petiolis 22–48 mm longis, confluentibus nodis, basi biglandulosis. Panicula 9.5–35 cm longa, deflexa, umbellis 4-floris, pedunculo florifero nullo, pedicellis 4.8–6.6 mm longis. Petala lutea, in alabastro exposita, patentia, abaxialiter laevia, marginibus integris; stylis posticis arcuatis, in apice dorsaliter rotundato vel truncato. Samarae 29–52 mm longae, nuce lateraliter laevi.

Liana, climbing to 3–7 m; basal *stems* 4.5–7.6 mm diam., cylindrical, smooth-sided, twisted, glabrate, developing small scattered lenticels. *Leaves* opposite; petiole (22–)32–48 mm long, glabrous, confluent across the node and forming a corky ridge, bearing a pair of prominent glands at base, each gland 0.8–2.5 mm diam.; stipules ca. 0.5 mm long, borne on the base of the petiole, caducous; lamina of larger leaves (7.9–)9.4–14.2 × 3.2–9.5 cm, membranous, oblong, ovate, cordate-oblong to elliptic, the base cordate or shallowly cordate, rarely acute, the apex obtuse, rounded or slightly retuse, the margin entire; hairs long-stalked in young leaves, forming a tomentose indument on primary and secondary veins on both sides, soon completely deciduous; midrib, lateral veins, and reticulum deeply impressed above and prominent below, producing a bullate surface. *Inflorescence* paniculate, terminal or axillary, pendulous, densely brown-sericeous, (9.5–)14.5–21 (–35) cm long; primary branches 12–20, 0.3–14.7 cm long; secondary branches 2–8, 0.2–2.6 cm long; tertiary branches 5–7, 0.2–0.5 cm long or absent; ultimate units 4-flowered umbels; inflorescence bracts ca. 1.1 × 0.9 mm, triangular, bright green, the margins entire, the base eglandular or biglandular, the glands 0.4–0.7 mm diam.; peduncle absent; floral bracts 0.5–1 × 1.3–1.6 mm, ovate, eglandular, densely sericeous abaxially, glabrous adaxially; bracteoles like bracts but smaller, eglandular; pedicel 4.8–6.6 × 1.1–2.6 mm (6.2–8 × 1.3–2.8 mm in fruit), densely brown-sericeous, somewhat thicker distally, straight. *Sepals* 1.6–1.8 × 1.4–1.6 mm, brown, rounded or acute at apex, strongly appressed to filaments in anthesis, tomentose abaxially, glabrous adaxially, the anterior sepal eglandular, the lateral 4 biglandular, the glands 2.4–2.9 mm long. *Petals* exposed in the enlarging bud, vivid yellow, glabrous, smooth abaxially; lateral petals spreading, the margin entire, the claw ca.

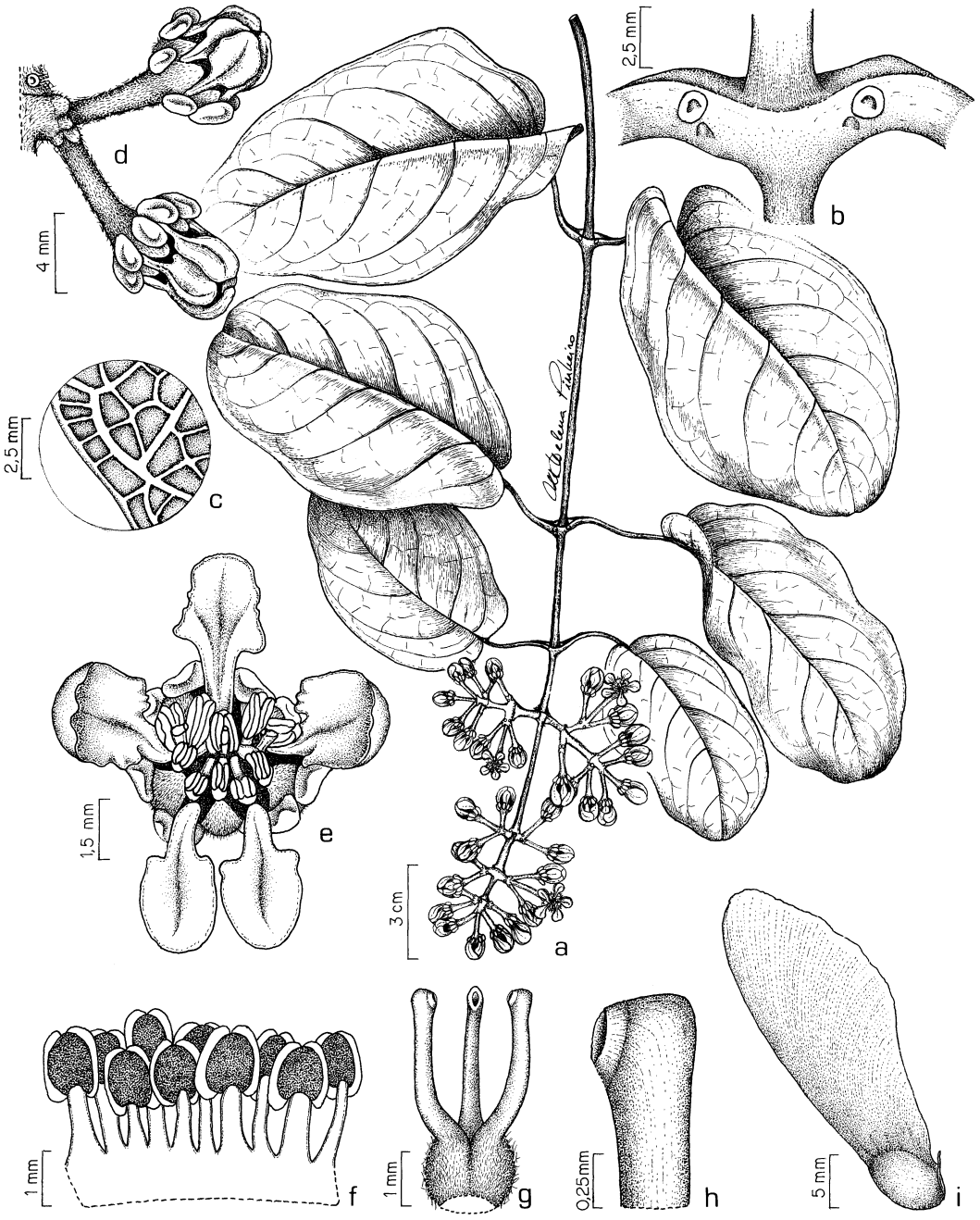

FIG. 4. *Heteropterys bullata*. **A.** Flowering branch. **B.** Detail of node showing corky ridge formed by confluent bases of petioles. **C.** Detail of abaxial surface of lamina. **D.** Umbel of flower buds, with two removed. **E.** Flower from above. **F.** Androecium, laid out, abaxial view: stamen second from right occurs opposite posterior petal; stamen fourth from left occurs opposite anterior sepal. **G.** Gynoecium, showing anterior style in middle. **H.** Detail of apex of posterior style. **I.** Samara. (a–h from the holotype, *Jardim et al. 3440,* CEPEC; i from *Jardim & Juchum 3049,* CEPEC.)

2.2 mm long, the limb 3.4–3.8 × 2.7–3 mm; posterior petal erect, minutely glandular-thickened at margin, the claw ca. 3.7 mm long, the limb 2.5–3 × 2.7–2.9 mm. *Stamens* glabrous, unequal; filaments 2–2.8 × 0.3–0.9 mm, connate ca. ½ their length; anthers 1.4–1.6 mm long, all alike, glabrous, erect to reflexed, the connective swollen and uniformly dark red. *Ovary* 1.2–1.4 mm high, densely sericeous; styles 3–3.2 mm long, slightly exceeding anthers, glabrous; anterior style erect and straight, occasionally inclined toward posterior petal, the apex slightly truncate or rounded; 2 posterior styles somewhat arcuate at base, the apex rounded; stigmas internal and facing center of flower or on oblique inner angle. *Samara* pale brown, 29–52 mm long, borne suberect, sparsely tomentose to glabrate; dorsal wing almost as long as samara, 21–44 × 13–19 mm; nut 5–8 mm diam., ovoid, with smooth surface, without lateral crests or winglets.

Distribution and habitat.—Known only from moist forest on some of the high mountains in southern Bahia (Fig. 5), above 600 m, in the Serra da Ouricana and Wenceslau Guimarães State Park. *Heteropterys bullata* grows in the canopy of dense primary rain forests, along rivers and in advanced secondary forests near cocoa plantations.

Etymology.—The epithet refers to the bullate surface of the leaves.

Phenology.—Flowering in April; fruiting in June and July.

Additional specimens examined: BRAZIL. **Bahia**: Mun. Floresta Azul, BR 415 em ramal de acesso a torre da Coelba, 14°56′32″S, 39°41′56″W, 28 Jun 2000 (imm. fr), *Amorim et al. 3551* (CEPEC, G, HUESC, MBM, MBML, MICH, NY, RB, SP), 25 Jul 2000 (fr), *Jardim & Juchum 3049* (CEPEC, HUEFS, MBM, MICH, NY, SP); Mun. Wenceslau Guimarães, Estação Ecológica Estadual Nova Esperança, Cachoeira do Rio Grande, 13°35′43″S, 39°43′18″W, 27 Jul 2001 (fr), *Mattos-Silva et al. 4480* (ALCB, CEPEC, HUEFS, HUESC, NY).

Heteropterys bullata is easily recognized by its petioles that are fused across the node into a corky ridge. This jointing of the petioles is very rare in *Heteropterys* but occurs in some species of *Stigmaphyllon* (e.g., *S. macedoanum* C. Anderson and *S. jatrophifolium* A. Juss). In addition, the midrib, lateral veins, and reticulum are deeply impressed above and prominent below, producing a bullate surface of the leaves; the petals are abaxially smooth with the posterior petal minutely glandular-thickened along the margin; the connectives are swollen; and the styles are truncate or rounded at the apex.

The affinities of *Heteropterys bullata* with other species of the subsection remain uncertain. *Heteropterys bullata* is allied with a group of species having short, distally enlarged pedicels and spreading petals, but its vegetative and floral characters are intermediate between *H. anomala* A. Juss. and a group of species with persistent tomentose indument on the abaxial side of the lamina, characteristics especially evident in *H. cordifolia* Moric. ex A. Juss. and *H. capixaba* (see below).

Heteropterys capixaba Amorim, sp. nov. (Fig. 6)

TYPE: BRAZIL. Espírito Santo: Mun. Santa Teresa, Santo Antônio, terreno do Bosa, 19°55′S, 40°36′W, 800 m, 15 Feb 2000 (fl), *A. M. Amorim* (with *G. M. de Sousa, L. Kollmann, E. Bausen & V. Demuner*) *3317* (HOLOTYPE: SP; ISOTYPES: CEPEC, G, MBM, MBML, MICH, RB).

Liana, flexuosa, ramis tomentosis demum glabratis. Lamina foliorum majorum 1.7–10 cm longa, 0.6–3.5 cm lata, ovata-lanceolata, oblongo-lanceolata vel obovata, basi cordata vel fere rotundata, margine revoluta, abaxialiter dense ferrugineo-tomentosa. Panicula deflexa, 2 umbellis 4 floris; pedunculo florifero nullo. Petala patentia, flavo-virescentia, in alabastro exposita, dorsaliter incrassata, margine integra vel breviter erosa; styli arcuati, in apice dorsaliter rotundati vel stylo antico in apice dorsaliter truncato. Samarae 23–42 mm longae, 5–15 mm latae, nuce laevi.

Liana with slender twining stems, climbing to 0.5–3 m; basal *stems* ca. 5 mm diam., cylindrical, loosely tomentose, soon glabrate; lenticels not seen. *Leaves* opposite; petiole 5–10 mm long, densely tomentose, bearing a pair of impressed glands at base, each gland ca. 0.4 mm. diam and hidden by indument; stipules minute, ca. 0.2 mm long, borne near the base of the petiole; lamina of larger leaves (1.7–)3.5–7.7(–10) × 0.6–2.8(–3.5) cm, membranous to chartaceous,

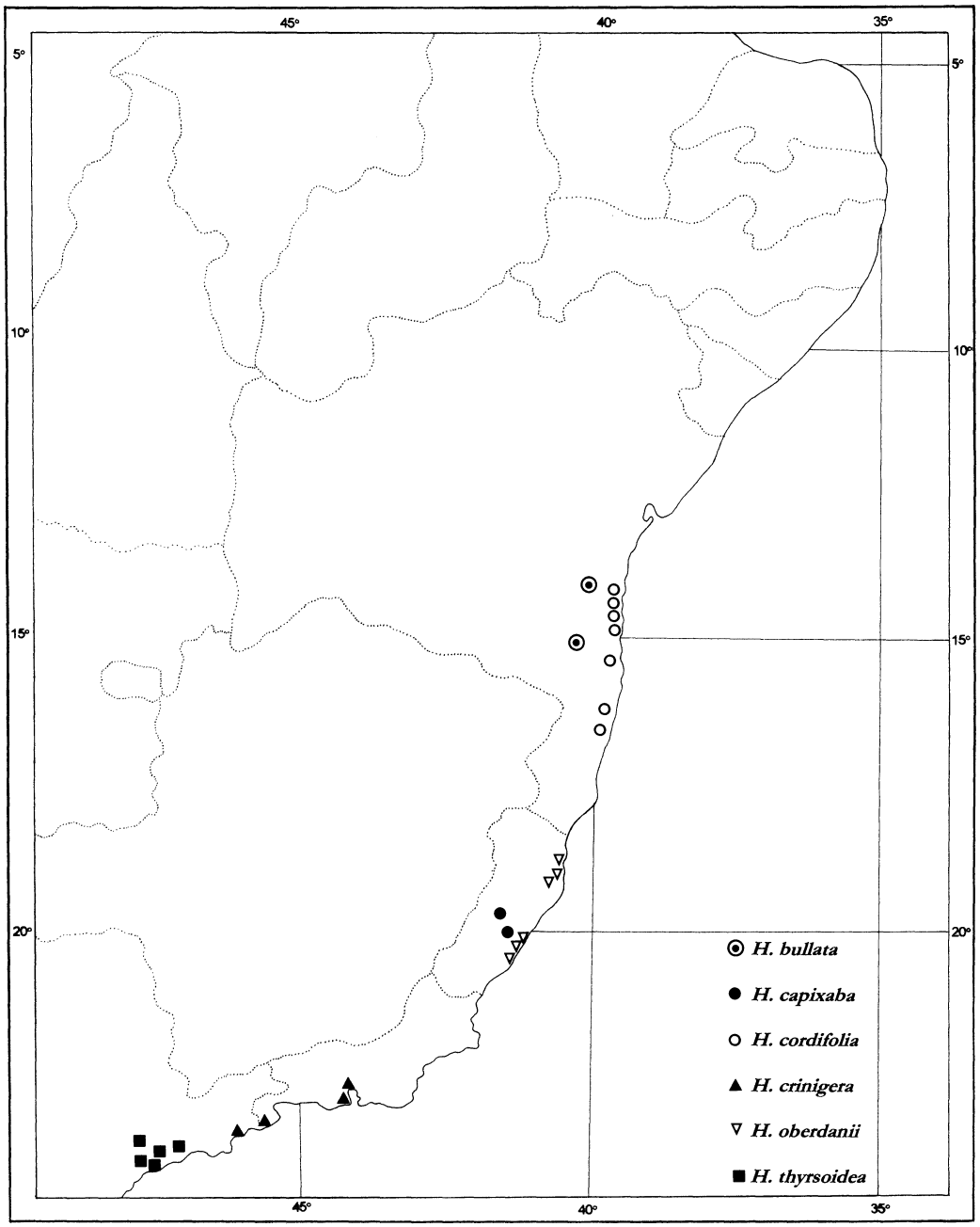

FIG. 5. Distribution of selected species of *Heteropterys* subsect. *Aptychia* in easternmost Brazil.

ovate-lanceolate to oblong-lanceolate or sometimes oblong to cordate-oblong, the base obtuse or rounded to slightly cordate, the apex acute or sometimes obtuse to apiculate, the margins entire, strongly revolute; hairs with a short stalk and a horizontal crosspiece, later deciduous or persistent on both sides, forming a densely ferrugineous indument, sparsely tomentose on the adaxial surface and densely tomentose abaxially; adaxial surface with impressed veins. *Inflorescence* a small panicle, terminal, pendu-

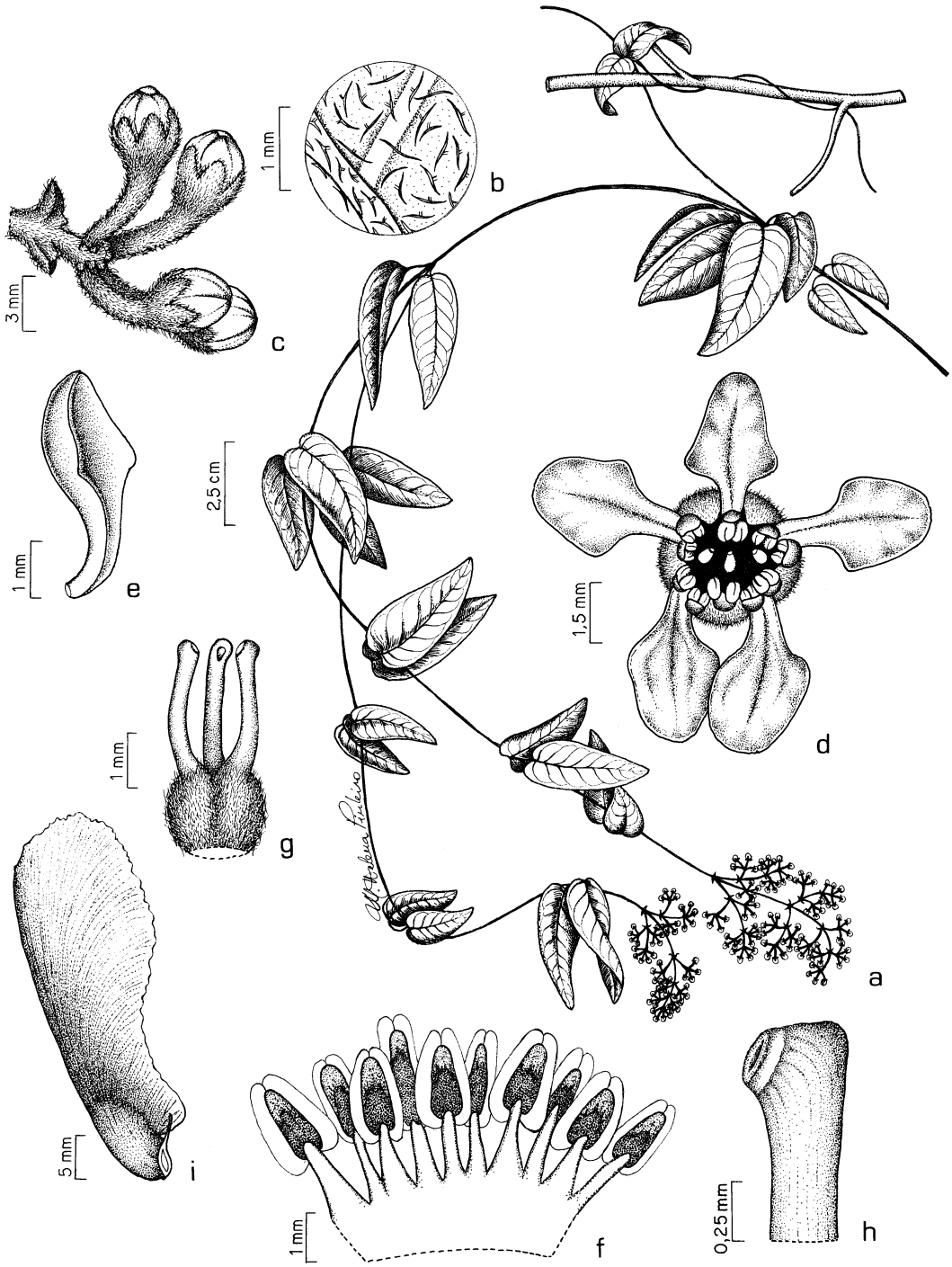

FIG. 6. *Heteropterys capixaba*. **A.** Flowering branch. **B.** Detail of abaxial surface of lamina. **C.** Umbel of flower buds. **D.** Flower from above. **E.** Lateral petal. **F.** Androecium, laid out, abaxial view: stamen second from right occurs opposite posterior petal; stamen fourth from left occurs opposite anterior sepal. **G.** Gynoecium, showing anterior style in middle. **H.** Detail of apex of posterior style. **I.** Samara. (a–h from the isotype, *Amorim et al. 3317,* CEPEC; i from *Kollmann et al. 2626,* MBML.)

lous, densely ferrugineous-tomentose, 3–9 cm long; primary branches 8–10, 0.5–2 cm long; secondary branches rarely present, then ca. 0.2 cm long; ultimate units 4-flowered umbels; inflorescence bracts ca. 1.9 × 1 mm, narrowly triangular, the margins entire and eglandular; peduncle absent; floral bracts ca. 0.5 × 0.5 mm, ovate, eglandular, tomentose abaxially, glabrous adaxially; bracteoles like bracts but smaller, eglandular; pedicel 6–6.6 × 0.8–2.3 mm (7.8 × 1–2.5 mm in fruit), densely tomentose, somewhat thicker distally, curved. *Sepals* 1.7–2.2 × 1.5 mm, pale brown, acute or slightly rounded at apex, appressed in anthesis, densely tomentose abaxially, glabrous adaxially, eglandular. *Petals* exposed in the enlarging bud, pale green yellow, glabrous, the margin entire or slightly erose, the limb thickened in center; lateral petals spreading, the claw 1.5–3.3 mm long, the limb 2.8–4.5 × 2.2–3 mm; posterior petal suberect, the claw ca. 2.3 mm long, the limb 3 × 2.2–2.5 mm. *Stamens* glabrous, slightly unequal; filaments 2–2.5 × 0.3–1.4 mm, connate ca. ½ their length; anthers 1.7–2.1 mm long, all alike, glabrous, erect, the connective proximally 2/3–4/5 dark red, distally 1/3–1/5 white. *Ovary* 1.5–1.8 mm high, thinly tomentose; styles exceeding anthers, glabrous or slightly tomentose at very base; anterior style ca. 2.9 mm long, straight, the apex slightly truncate or rounded; 2 posterior styles 2.5–2.6 mm long, somewhat arcuate at base and bent toward posterior petal, the apex rounded dorsally; stigmas internal and facing center of flower or on oblique inner angle. *Samara* reddish pink at maturity, 23–35(–42) mm long, borne erect when single, suberect when double, sparsely tomentose; dorsal wing almost as long as samara, 20–34 × 5–15 mm; nut 5–12 mm diam., ovoid, with smooth surface, without lateral crests or winglets.

Distribution and habitat.—This species is found in the moist Atlantic coastal forest, between 600 and 800 m, and is known only from localities near each other along the slopes of the mountains in the Mun. Santa Teresa, in Espírito Santo, Brazil (Fig. 5). *Heteropterys capixaba* is a slender liana growing below the canopy in the shaded primary forest and in forest remnants near coffee plantations.

Etymology.—The specific epithet is an indigenous Portuguese name meaning fertile land and usually is used to refer to people born in the state of Espírito Santo.

Phenology.—Flowering from February to May; fruiting from May to July.

Additional specimens examined: BRAZIL. **Espírito Santo**: Mun. Cariacica, Reserva Biológica Duas Bocas, 20°17′35″S, 40°31′03″W, 7 Mar 2001 (imm. fl), *Sousa et al. 465* (MBML, SP); Mun. Santa Teresa, Alto do Julião, 14 Jul 1984 (fr), *Pizziolo 148* (MBML); Estação Biológica da Caixa d'Água, 17 Apr 1985 (fl), *Boone 378* (MBML); Santo Antônio, terreno do Bosa, 19°55′S, 40°36′W, 22 Mar 1999 (fl), *Kollmann et al. 2217* (CEPEC, MBML), 30 May 2000 (fr), *Amorim et al. 3391* (CEPEC, MBM, MBML, MICH, SP); São Lourenço, 19°55′S, 40°36′W, 7 Apr 1999 (fl), *Kollmann et al. 2431* (CEPEC, MBML, MICH), 17 Jun 1999 (fr), *Kollmann et al. 2626* (CEPEC, MBML), 31 May 2000 (fl, fr), *Amorim et al. 3398* (CEPEC, RB, SP).

Heteropterys capixaba is easily distinguished from other related species of eastern Brazil (*H. crinigera* A. Juss., *H. thyrsoidea* (Griseb.) A. Juss. and *H. cordifolia* Moric. ex A. Juss.) by its climbing habit with slender twining stems; its shorter leaves; its petals that are thickened in the center of the limb and have entire or slightly erose margins; its two posterior styles rounded dorsally at the apex; and its reduced samara with an ovoid nut.

Heteropterys capixaba is most similar to *H. cordifolia*, a variable species known only from southern Bahia. The two species share these characteristics: the leaf base generally is rounded to slightly cordate; the lamina is abaxially densely tomentose with ferrugineous indumentum; the stamens are of unequal shape; and the styles are apically rounded. The principal differences between the two are in their habit (*H. capixaba* is slender, *H. cordifolia* robust), leaf size (shorter leaves rarely exceeding 7.7 cm in length vs. leaves 7–23.2 cm long), and posterior styles (a somewhat arcuate base vs. a straight and parallel base).

Niedenzu (1928) listed *Heteropterys cordifolia* as a synonym of *H. thyrsoidea*, because early collections of this species were incomplete. The type of *H. cordifolia*, collected by Blanchet in Bahia, is a fruiting

specimen and the type of *H. thyrsoidea*, collected by Sellow, probably in São Paulo, is a flowering specimen. After examination of a fragment of the type of *H. thyrsoidea*, housed in P-JU (the holotype at B was destroyed), intensive fieldwork in the states of Bahia and São Paulo, and analysis of herbarium material in flower and fruit, I have determined that both species can be readily recognized as distinctive, with disjunct distribution (Fig. 5).

Heteropterys oberdanii Amorim, sp. nov. (Fig. 7)

TYPE: BRAZIL. Espírito Santo: Mun. Guarapari, Parque Estadual de Setiba, ramal de acesso a Lagoa Vermelha, 20°17′35″S, 40°25′53″W, 10 m, 21 Feb 2000 (fl), *A. M. Amorim (with G. M. de Sousa & C. N. Fraga) 3346* (HOLOTYPE: SP; ISOTYPES: CEPEC, G, MBM, MICH, NY, RB, VIES).

Liana, ramis teretibus glabrescentibus. Folia appressa; laminae 5–11 cm longae, 2.4–5 cm latae, ovatae, oblongae, lanceolatae, ovato-oblongae vel ovato-lanceolatae, utrinque glabratae, marginibus aliquot glandulis parvis munitis; petiolus 6–17 mm longus, basi biglandulosus. Panicula erecta, 6–32 cm longa, 4–20-floribus decussatis, pedunculo florifero nullo, pedicellis 1.6–2.5 mm latis. Petala flava, in alabastro exposita, patentia, dorsaliter carinata, margimbus integris; stamina glabra; stylis arcuatis, in apice dorsaliter apiculatis. Samara rosea, 30–32 mm longa, 9–13 mm lata, nuce lateraliter laevi.

Liana, climbing to 1.5–10 m; basal *stems* 8–8.5 mm diam., cylindrical, twisted, glabrate, developing small, scattered lenticels. *Leaves* mostly erect, decussate, frequently appressed; petiole 6–17 mm long, glabrous or initially sparsely sericeous and soon glabrate, bearing a pair of impressed glands at base, each gland ca. 0.6 mm diam.; stipules ca. 0.3 mm long, seldom evident, borne on base of petiole; lamina of larger leaves (5–)6.1–11 × 2.4–3.7(–5) cm, subcoriaceous, ovate, oblong, ovate-lanceolate, ovate-oblong to oblong-obovate or sometimes lanceolate, rarely orbicular or oblong-lanceolate, the base acute to obtuse or rarely rounded, the apex acute, obtuse, or retuse, rarely truncate or apiculate, the margins bearing many small bordered glands, initially sparsely sericeous but very soon glabrescent, the lateral veins and reticulum prominulous on both sides, slightly more so below than above. *Inflorescence* paniculate, 6–32 cm long, terminal or rarely axillary, erect, densely and persistently brown-sericeous, the flowers borne ultimately in 6–18 elongated pseudoracemes, these 1.2–17 cm long and containing 4–20 mostly decussate flowers; inflorescence bracts 4–4.3 × 0.8–1.5 mm, lanceolate, bright green, the margins entire, the base biglandular, the glands ca. 1.2 mm diam.; peduncle absent; floral bracts ca. 0.6 × 1.5 mm, rounded, biglandular with each gland ca. 0.8 mm diam., densely sericeous abaxially, glabrous adaxially; bracteoles similar to bracts but eglandular and smaller; pedicel 3.5–5.7 × 1.6–2.5 mm (4–6 × 2–2.7 mm in fruit), densely brown-sericeous, somewhat thicker distally, curved. *Sepals* ca. 2.6 × 2 mm, brown, rounded at apex, pressed against filaments in anthesis, densely brown-sericeous abaxially, glabrous adaxially, the anterior sepal eglandular, the lateral 4 biglandular, the glands 1.1–2.5 mm long, elliptical. *Petals* exposed in the enlarging bud, vivid yellow, glabrous, keeled abaxially; lateral petals spreading, the margin entire, the claw 2–2.5 mm long, the limb 4.2–5 × 3.7–6.2 mm; posterior petal erect, the margin minutely glandular-thickened, the claw 3.5–4.5 mm long, the limb 2.9–3.8 × 3.4–3.8 mm. *Stamens* glabrous, unequal; filaments 1.4–3 × 0.3–1.2 mm, connate ca. 1/3 their length; anthers 1.1–1.8 mm long, all alike, glabrous, erect to reflexed, the connective proximally 2/3–4/5 dark red, distally 1/3–1/5 white. *Ovary* ca. 1.2 mm high, sericeous; styles 3–4.3 mm long, equaling or slightly exceeding anthers, glabrous or proximally sericeous, the apex dorsally strong-apiculate or pedaliform; anterior style erect and somewhat straight; 2 posterior styles strongly arcuate outward from base; stigmas internal, all 3 facing center of flower. *Samara* reddish pink at maturity, 30–32 mm long, borne horizontally, sparsely tomentose to glabrate; dorsal wing 24–27 × 9–13 mm; nut 4–5 mm diam., subspheroidal, with smooth surface, without lateral crests or winglets.

Distribution and habitat.—Heteropterys oberdanii is known only from the coast of Espírito Santo, Brazil (Fig. 5), where it is

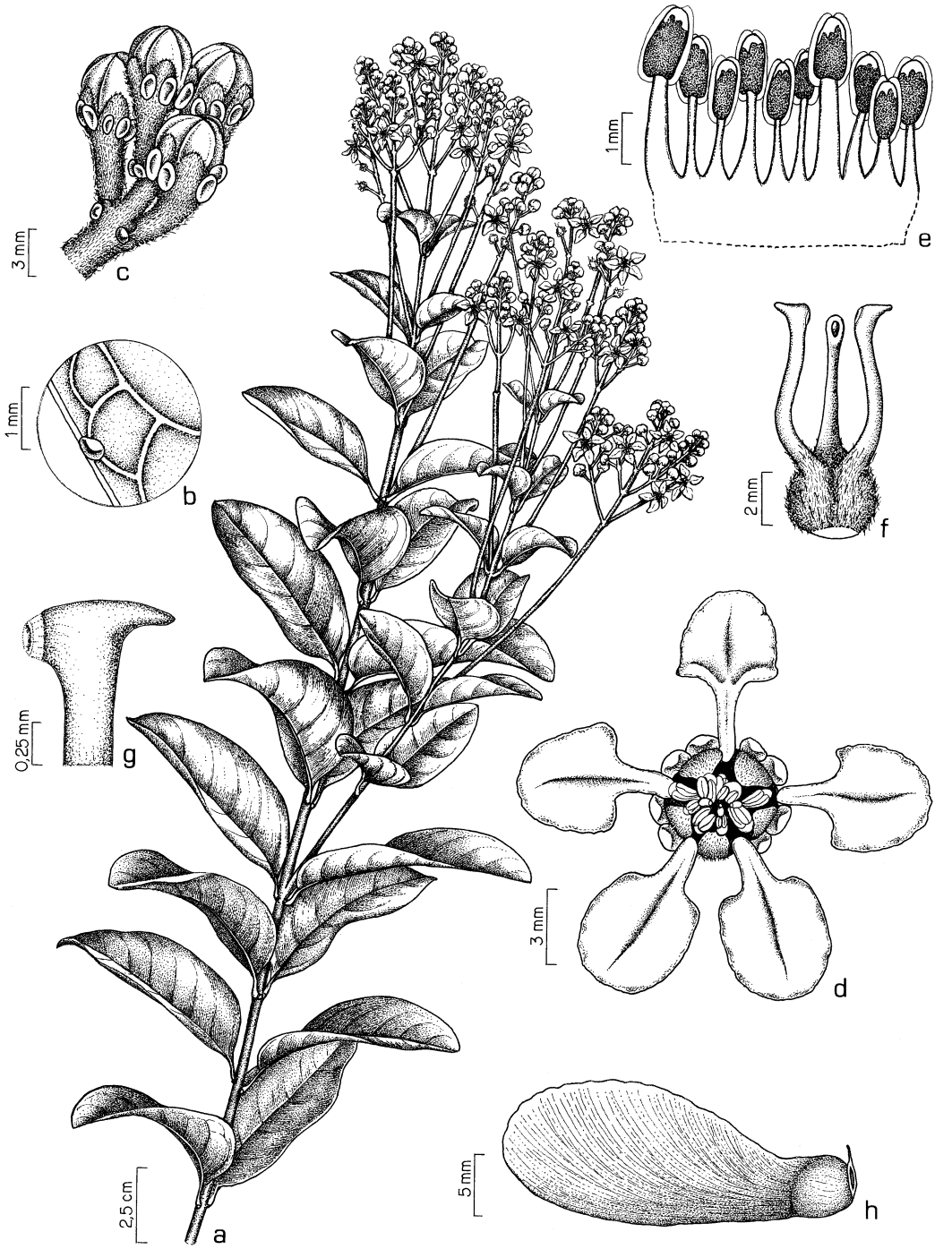

FIG. 7. *Heteropterys oberdanii*. **A.** Flowering branch. **B.** Detail of abaxial surface of lamina. **C.** Detail of flower buds. **D.** Flower from above. **E.** Androecium, laid out, abaxial view: stamen second from right occurs opposite posterior petal; stamen fourth from left occurs opposite anterior sepal. **F.** Gynoecium, showing anterior style in middle. **G.** Detail of apex of posterior style. **H.** Samara. (a–g from the isotype, *Amorim et al. 3346,* CEPEC; h. from *Amorim et al. 3359,*CEPEC.)

common in the permanently flooded restinga forests (Pereira, 1990). It grows into the canopy.

Etymology.—The epithet of *Heteropterys oberdanii* honors Oberdan José Pereira, who, with the help of his collaborators from the Universidade Federal do Espírito Santo in Vitória, has made very important contributions to our knowledge of the flora of the restinga.

Phenology.—Flowering in January to March; fruiting in February and March.

Additional specimens examined: BRAZIL. **Espírito Santo**: Mun. Conceição da Barra, Área 213 da Aracruz Florestal, 25 Mar 1992 (fr), *Pereira et al. 3063* (CEPEC, VIES); Mun. Conceição da Barra, Parque Estadual de Itaúnas, 30 Mar 2000 (fr), *Pereira 6092* (VIES); Mun. Guarapari, Parque Estadual de Setiba, 18 Mar 1984 (fl, fr), *Weinberg 693* (MICH), 20°37′22″S, 40°25′53″W, 5 Mar 2001 (fl, fr), *Sousa & Alves 457* (CEPEC, SP, VIES); Mun. Linhares, Jazida Payer, próximo a Fazenda São Jorge, 10 Mar 1997 (fl, fr), *Zambom & Pereira 336* (CEPEC, VIES); Mun. Sooretama, Reserva Florestal da Vale do Rio Doce, margem do Córrego São Pedro, 23 Feb 2000 (fl, fr), *Amorim et al. 3359* (CEPEC, CVRD, G, MBM, MICH, RB, SP, VIES); Mun. Vila Velha, Lagoa do Milho, 14 Jan 1975 (imm. fl), *Peixoto et al. 378* (MICH, RB).

Heteropterys oberdanii belongs to the difficult "anomalous-stemmed complex." *Heteropterys anomala* A. Juss., which includes *H. patens* (Griseb.) A. Juss., is a polymorphic species, widely distributed in easternmost Brazil from Rio Grande do Norte to northern São Paulo. It deserves further study. The probable result will be its division into several entities.

After intensive fieldwork and a study of the types of *Heteropterys anomala* and *H. patens*, I distinguish *H. oberdanii* by the following combination of characters: leaves erect, appressed, with a short petiole (6–17 mm long); inflorescence erect with the flowers borne ultimately in pseudoracemes, each containing 4–20 decussate flowers; short pedicel (3.5–5.7 mm long), that thickens somewhat distally; petals all vivid yellow, with the posterior petal minutely glandular-thickened at the margin; styles glabrous or proximally sericeous and dorsally strongly apiculate at the apex; and samara reddish pink, borne horizontally with a reduced dorsal wing (24–27 mm long).

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