Revision of the genus *Blotia* (Euphorbiaceae-Phyllanthoideae)

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ABSTRACT
Revision of the genus *Blotia* Leandri (Euphorbiaceae-Phyllanthoideae) endemic to Madagascar. Five species are recognised, one new combination is made, two taxa are subsumed under *B. bemarensis*, and one name is excluded from the genus.

MOTS CLÉS
Euphorbiaceae,
Phyllanthoideae,
Blotia,
Madagascar.

RÉSUMÉ
Révision du genre *Blotia* Leandri (Euphorbiaceae-Phyllanthoideae) endémique de Madagascar. Cinq espèces sont reconnues, une nouvelle combinaison est établie, deux taxa sont mis en synonymie sous *B. bemarensis*, et un nom est exclu du genre.

INTRODUCTION

Blotia is a genus of five closely related species endemic to Madagascar. It belongs to the Euphorbiaceae-Phyllanthoideae and has been placed consistently in the tribe Wielandieae, which is often considered to be the basal tribe of the subfamily (WEBSTER 1994: 35). Within the Phyllanthoideae, *Blotia* is identified by the combination of persistent stipules, finely reticulate leaf venation, monoecy, presence of petals, partly fused filaments, sphaeroidal pollen grains and the lack of endosperm in the mature seeds as well as by its thin cotyledons, which are folded in a characteristic manner (Fig. 3E-F).

The plicate cotyledons led LEANDRI (1957: 240) to describe the genus, which he dedicated to Madame TARDIEU-BLOT, pteridologist at the Paris Museum. He included three species first described in *Savia* Willd. as well as two new species. Two of LEANDRI's species are here considered to be conspecific while *Blotia leandriana* Petra Hoffm. & McPherson (1996: 249) has been described in the course of our studies of the Euphorbiaceae-Phyllanthoideae of Madagascar. The poorly known *Petalodiscus mimosoides* (Baill.) Pax was found to be conspecific with *Blotia hildebrandtii* (Baill.) Leandri. As the former has the older basionym, the new combination *Blotia mimosoides* (Baill.) Petra Hoffm. & McPherson has to be made.

This study has been carried out using dried material only. The measurements of floral parts have been taken from softened flowers; all other characters were observed in a dry state. Good fertile material is needed for identification, as the differences between the species are rather subtle and most characters show considerable infraspecific variation.

BLOTIA Leandri

Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 240 (1957); in Humbert, Fl. Madagascar 111(1): 126 (1958); Eg. Köhler, Grana Palynol. 6: 80 (1965); Levin, Syst. Bot. 11: 520-522 (1986); Mennega, J. Linn. Soc., Bot. 94: 114-115, 118 (1987); Greuter et al., Regnum Veg. 129: 136 (1993); G.L. Webster, Ann. Missouri Bot. Gard. 81: 36 (1994).

TYPE.—*Blotia oblongifolia* (Baill.) Leandri, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 240 (1957) [*Savia oblongifolia* Baill.].—Fig. 1.

Monoecious trees or shrubs with a weakly developed, simple indumentum. Leaves alternate, petiolate, simple, eglandular, blades symmetrical, entire, pinnately veined, elliptic, ovate or oblong, apex acuminate to acute (rarely obtuse), base acute to rounded, not decurrent. Anticlinal walls of the epidermal cells straight, stomata cyclocytic with 3-6 subsidiary cells. Petiolar vascular bundles compressed cylindrical throughout. Stipules persistent.

Inflorescences fasciculate, axillary, borne directly in the leaf axils or on short, unbranched, leafless axes, sometimes cauline, staminate and pistillate flowers together in the same fascicle. Flowers pedicellate, 5-merous (rarely 4- or 6-merous) except for the gynoecium. Bracts 3 per flower. Pedicel inarticulate. Sepals imbricate, quincuncial in 5-merous flowers. Petals 1/2-3 times as long as the sepals. Disc extrastaminal, annular, thick, more rarely thin, margin episepalously crenate to almost entire (very delicate and crenulate to lacerate in pistillate flowers of *B. mimosoides*). Stamens episepalous, filaments fused basally to various degrees, anthers introrse, longitudinally dehiscing. Pistillode clavate to cylindrical, 3(-4)-lobed. Ovary 3(-4)-locular, ovules 2 per locule, anatropous (funicle departing nucellus below apex), sharing a single 2-lobed obturator. Styles 3(-4), 2-lobed from the base. Stigmas acute to truncate.—Fig. 2.

Fruits capsular, mostly solitary (only one flower per fascicle seems to reach fruit maturity), subglobose to globose, 3(-4)-lobed, dehiscence septicidal, loculicidal and septifragal, dehiscence of septa irregular. Columella persistent, 6-10 times longer than the narrowest width, acutely 3-angled in cross section, base and apex only slightly thickened, disc and perianth persistent in the fruiting stage.—Fig. 3A-B.

Seeds 1-2 per locule, ecarunculate, shortly apiculate, with a ± distinct perichalazal annulus, globose to ovoid (1-seeded locules) or nearly triangular in cross section (2-seeded locules), smooth. Endosperm in mature seeds absent but

for a thin membrane, cotyledons thin, folded several times, radicle about three times longer than wide.—Fig. 3C-F.

Five species, distributed throughout Madagascar except for the dry south-western domain, not known from the Comoro Islands.

Fig. 1.—***Blotia oblongifolia***. Reproduced from BAILLON (1892, t. 208).

Key to the species

1. Sepals thickened and usually pubescent at tips; leaf blades (2.5-)4-9 cm long; petioles not canaliculate; flowers 3-6 mm long ..... 5. **B. tanalorum**
1'. Sepals undifferentiated apically, glabrous; leaves and petioles various; flowers 1.5-3 mm long 2
2. Petioles 3-10 mm long, canaliculate; fruits 10-13 mm long ..... 4. **B. oblongifolia**
2'. Petioles 1-3 mm long, canaliculate or not, fruits 6-9 mm long 3
3. Petals (1.5-)2-3 mm long, usually longer than the sepals at anthesis, clawed only at the base; leaf blades auriculate, ovate to elliptic ..... 1. **B. bemarensis**
3'. Petals 1-1.5 mm long, as long as or shorter than the sepals at anthesis, clawed for about half the length; leaf blades auriculate or not, elliptic 4
4. Leaf blades auriculate, 1.5-3(-4) cm long; pedicels less than 15 mm long; petals 1 mm long ..... 3. **B. mimosoides**
4'. Leaf blades not or scarcely auriculate, 2-6(-8) cm long; pedicels 10-20 mm long; petals 1-1.5 mm long ..... 2. **B. leandriana**

1. **Blotia bemarensis** (Leandri) Leandri

Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 242 (1957); in Humbert, Fl. Madagascar 111(1): 130 (1958); Muller et al., Trop. Subtrop. Pflanzenwelt 67: 84 (1989).—*Savia bemarensis* Leandri, Bull. Soc. Bot. France 81: 588 (1934); Bull. Soc. Bot. France 84: 65 (1937); Notul. Syst. (Paris) 7: 189 (1939).—Type: *Leandri 938*, Madagascar, Tsingy du Bemaraha (9e Réserve), Anjohivazimba, 150-200 m (holo-, P!). There are specimens numbered *938bis* in BM, P and S.

Blotia ankaranae Leandri, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 242 (1957); in Humbert, Fl. Madagascar 111(1): 128 (1958); Eg. Köhler, Grana Palynol. 6: 50, t. 6, Fig. 4-6 (1965).—Type: *Service des Eaux et Forêts 9383*, Madagascar, Ankara de Diego-Suarez (holo-, P!); *syn. nov.*

Blotia ankaranae Leandri var. *sambiranensis* Leandri, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 243 (1957); in Humbert, Fl. Madagascar 111(1): 130 (1958).—Type: *Humbert 18642*, Madagascar, Bassin supérieur du Sambirano, 1700 m (lecto-, P!, chosen here; isolecto-, K!, P!); *syn. nov.*

Both species and variety were separated from *B. bemarensis* on the basis of leaf size, a feature that additional collecting has shown to vary widely within *B. bemarensis*.

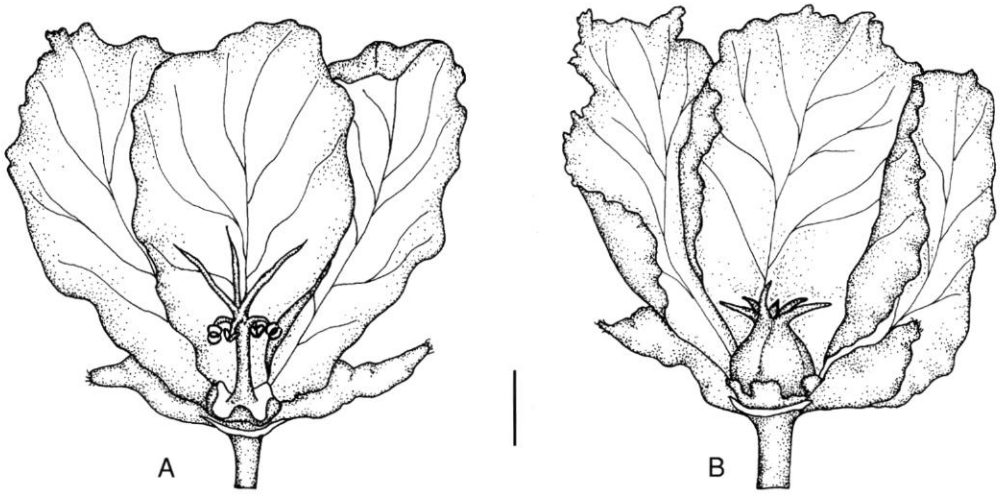

Fig. 2.—Flowers of ***Blotia tanalorum***, perianth partly removed: **A**, staminate flower; **B**, pistillate flower. *Rakoto 8929-RN* (P). Scale bar = 1 mm.

Shrub or small tree, 2-10 m tall. Young twigs terete, glabrous or patulously hairy. Leaves ovate, rarely elliptic, apex acuminate to caudate, base rounded or more rarely obtuse to acute, margins sometimes attenuate, auriculate, 2-5(-7) cm long, 1-2.5 cm wide, glabrous, coriaceous to chartaceous, green, greyish green, olive-green or yellowish, dull to shiny, midvein prominent on both sides, secondary venation not conspicuous compared with finer venation, finer venation less prominent above, more prominent beneath. Leaves often involute like the stipules when dry. Petiole terete, rarely slightly canaliculate, 1-2 mm long, 0.5-0.8 mm wide, glabrous or patulously hairy. Stipules narrowly deltoid to linear, acute, 2-4 mm long, 0.5-1 mm wide, ± ciliate, otherwise glabrous, light to dark brown when dry, often involute.

Inflorescences axillary and cauline on the same plant, staminate and pistillate flowers together in fascicles of ca. 2-30, borne directly in the leaf axils and/or on unbranched, leafless axes up to 1 cm long. Flowers pink and white to greenish.

Staminate flowers 2.5-3 mm long, ca. 4 mm wide. Bracts deltoid, acute, ca. 1 mm long, ca. 0.5 mm wide, glabrous or ciliate and hairy beneath. Buds globose, obtuse. Pedicel terete to flat, (5) 15-30 mm long, 0.2-0.3 mm wide, glabrous. Sepals 5, ovate to oblong, obtuse to rounded, 1.5-2.5 mm long, 1-1.5 mm wide, erose, mostly delicate, with a ± hyaline margin, not thickened apically, glabrous. Petals 5, oblong to rhombic, rounded to acute, clawed only at the base, slightly erose, delicate and sometimes stuck together (see under *B. tanalorum*), (1.5-)2-3 mm long, 1-2 mm wide, 1-2 times as long as the sepals, glabrous. Disc annular, margin episepalously crenate, 0.2-0.3 mm long, thick, glabrous. Stamens 5; 1-1.5 mm long, filaments fused at the base for 1/3 to 2/3 of their length, flat to terete, 1-1.5 mm long, their free part horizontally spreading, anthers nearly globose, 0.2-0.3 mm long, glabrous, base of anther cells usually separated by the expanded filament. Pistillode clavate to cylindrical, 1-3 times longer than wide, 0.5-0.7 mm long, 0.2-0.5 mm wide, 3-fid up to about the middle, branches semiorbicular to cylindrical, sometimes canaliculate adaxially, erect to slightly spreading, about as long as wide, glabrous.

Pistillate flowers ca. 3 mm long, ca. 4 mm wide. Bracts as in staminate flowers. Buds ellipsoid, obtuse. Pedicel terete, 5-25 mm long, 0.4-0.5 mm wide, slightly thickened distally, glabrous. Sepals 5, deltoid, ovate or oblong, acute, rarely rounded, 1.5-3 mm long, 1.5-2 mm wide, with a hyaline margin, glabrous. Petals 5, rhombic to elliptic, obtuse to rounded, clawed only at the base, slightly erose, robust to very delicate, (1.5-)2-3 mm long, 1.5-2 mm wide, 1-2 times as long as the sepals, glabrous. Disc as in staminate flowers. Ovary ovoid, ca. 1 mm long, glabrous. Styles 2-fid from the base or slightly less, their branches terete, ca. 0.5 mm long, ca. 0.2 mm wide, nearly straight, horizontally spreading, glabrous. Stigmas acute to truncate.

Fruits solitary, subglobose, 3-lobed, ca. 8 mm long, ca. 10 mm wide, glabrous, reticulate, medium to dark brown. Fruiting pedicels terete, up to 25 mm long, ca. 0.5 mm wide, glabrous. Columella 6-9 mm long, up to 1 mm wide in the middle, base scarcely thickened, apex thickened to 2 mm. Exocarp 0.1-0.3 mm thick, verrucate on inner surface. Endocarp 0.3-0.5 mm thick.

Seeds 5-6(-9) mm long, 5-6(-7) mm (1-seeded locules) or ca. 4 mm (2-seeded locules) wide, dull to slightly shiny, marbled, reddish brown.

DISTRIBUTION.—Northeastern Madagascar, dry zone, and transition to subhumid bioclimatic zone of CORNET 1974 (western floristic domain).

ECOLOGY.— Forest (forêts tropophiles, forêts ombrophiles), on limestone or sand; 100-1700 m.

VERNACULAR NAMES.—Koripity (*Rakotovao 5615-RN*); Morasira (*Zsiligy 2970-RN*); Tsiavango (*Ramaroson 7367-RN*).

ICONOGRAPHY.—LEANDRI, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 241, Fig. 7.12-14 (1957), habit, flower, embryo; LEANDRI in HUMBERT, Fl. Madagascar 111(1): 123, Fig. 20.9-10, habit; 127, Fig. 21.12-16 (1958), habit, flower, embryo, more elaborate version of the same drawings; Eg. Köhler, Grana Palynol. 6: t. 6, Fig. 4-6 (1965), pollen.

SPECIMENS EXAMINED.—MADAGASCAR: *Capuron 18349-SF*, Est, Environs de la Baie d'Antongil, massif

de Farankaraina, entre Navana et Andranofotsy, 9-150 m, 20 Sep. 1957 (K!, P!); *Capuron 18996-SF*, Ouest (Nord), Ankarana, au Nord-Est d'Ambondromifehy, causses et plateaux calcaires, 13 Nov. 1958 (K!, MO!, P!); *Capuron 20985-SF*, Ouest (Nord), Forêt du Sahafary, bassin de la Saharaina, 200 m, sables, 20 Feb. 1962 (K!, MO!, P!); *Capuron 22034-SF*, Ouest (Nord), Ankarana, près d'Ambondromifehy, 17 Nov. 1962 (K!, MO!, P!); *Capuron 22299-SF*, Est (sud), Forêt du Vinanibe, sur sables, près de Fort-Dauphin, 9 Jan. 1963 (P!); *Decary 15758*, Soalala, Namoroka, Reserve No. 8, 15 Sep. 1940 (MO!, P!); *Dokobe 10313-RN*, Antsalova, 11 Dec. 1958 (K!, MO!, P!); *Dorr et al. 3641*, Antananarivo, ca. 5 km NW of Ambohitsaratelo-Bebao (NW of Tsiroanomandidy), forest, overhanging stream, 24 Jan. 1985 (K!, MO!); *Du Puy et al. MB372*, NW Madagascar, prov. of Mahajanga, Mahajanga, BOINA region, ca. 15 km NW of the village of Vilanandro, Reserve National Integral of Nemoroka (sic!), ca. 140 m, limestone massif with pockets of basaltic soils, tsingy, 25 Sep. 1989 (K!, MO!, P!); *Humbert 18642*, Bassin supérieur du Sambirano, 1700 m, sol siliceux, forêt ombrophile, Nov.-Dec. 1937 (K!, MO!, P!), type of *B. ankaranae* var. *sambiranensis*; *Humbert 19196*, Diego-Suarez, Analamera, pentes de la rive droite de l'Analabe, affluent du Rodo, collines et plateaux calcaires, forêt tropophile, Jan. 1938 (MO!, P!); *Leandri 938*, Tsingy du Bemaraha, 9. Reserve, Anjohivazimba, 150-200 m, rochers calcaires, 17 Feb. 1933 (P!), type; *Leandri 938bis*, Tsingy du Bemaraha, 9. Reserve, Anjohivazimba, 150-200 m, rochers calcaires, 17 Feb. 1933 (BM!, P!, S!); *Leandri 382*, Tsingy du Bemaraha, 9. Réserve, rochers calcaires, Feb.-Apr. 1933 (K!, US!); *Leandri et al. 2049*, Antsingy, vers Ambodiriana (E d'Antsalova), 100-150 m, calcaires, forêts à feuilles caduques, 7 Dec. 1952 (P!); *Meyers 247*, Antsiranana, Antsahalalina, part of Bobankora Range, 12 km E of Daraina, 205-607 m, 21 Jan. 1991 (K!); *Perrier de la Bâthie 111*, Ouest, Ambodiroka, près de Maevatanana, Nov. 1896 (P!); *Perrier de la Bâthie 841*, Ouest, Bois Firingalava, rive droite de l'Ikopa entre Andriba et Maevatanana, Dec. 1898 (MO!, P!); *Perrier de la Bâthie 1243*, Ouest, Iabohazo, près du mont Tsitondroina, alluvions siliceux calcaires, forêts humides, Jan. 1902 (MO!, P!); *Perrier de la Bâthie 4568*, Ouest, Boïna (K!, P!); *Rakotovao 5615-RN*, Soalala, Canton Andranomavo, Reserve No. 8, pente, 23 July 1953 (P!); *Ramaroson 7367-RN*, Antsalova, Antsingy, 22 Sep. 1955 (K!, MO!, P!); *Randriamiera 72-RN*, Soalala, Canton Andranomavo, Ampidriabe, Vilanandro à 3 km, Anteradahy, forêt du Tsingy, 8 Oct. 1957 (MO!, P!); *Randrianasolo 2198-RN*, Soalala, Andranomavo, Namoroka, 23 Nov. 1950 (P!); *Service des Eaux et Forêts 9383-SF*, Diego-Suarez, Ankara, 11 Mar. 1954 (MO!, P!), type of *B. ankaranae*; *Service des Eaux et Forêts 12038-SF*, Diego-Suarez, Ankara-J.B. 8, 10 Nov. 1954 (MO!, P!); *Service des Eaux et Forêts 16570-SF*, Antsalova distr., canton et village, formation ripicole, dégradée, sol alluvionnaire, 9 Oct. 1956 (P!); *Zsiligy 2970-RN*, Soalala, Andranomavo, terrain flat (P!).

2. Blotia leandriana Petra Hoffm. & McPherson

Novon 7: 249 (1996).—Type: *McPherson & Dumetz 14651* (holo-, MO!; iso-, B!, DAV!, K!, P!, TAN!, TEF!).

Almost glabrous shrubs or small trees, up to 8 m tall. Young twigs terete, glabrous or with few short patulous hairs, shiny. Leaves elliptic, margin entire, leaf apex acuminate to acute, very apex rounded, leaf base acute, margins concave to convex, not auriculate, (2-)3-6(-8) cm long, 1-3 cm wide, glabrous, coriaceous or rarely chartaceous, light greyish green when dry, dull, midvein prominent on both sides, secondary venation not conspicuous compared with finer venation, finer venation less prominent above, more prominent beneath. Petiole terete, not canaliculate, 1-3 mm long, 0.7-1 mm wide, glabrous. Stipules linear, acute, 3-4 mm long, 0.5-1 mm wide, glabrous, very thin, red to black when dry, usually persistent, but easily broken off.

Inflorescences axillary (but reported also to be cauline), staminate and pistillate flowers together in fascicles of 5-20, borne directly in the leaf axils or on unbranched, usually leafless axes up to 1 cm long.

Staminate flowers ca. 2 mm long, 2-2.5 mm wide. Bracts deltoid, acute, ca. 0.5 mm long, ca. 0.5 mm wide, glabrous but ciliate. Buds globose. Pedicel terete, 10-15 mm long, ca. 0.2 mm wide, glabrous. Sepals 5, oblong to obovate, apex rounded, not thickened, 1.5-2 mm long, 1-1.2 mm wide, entire, glabrous, thick. Petals 5, spathulate, rounded, 1.2-1.5 mm long, 0.7-1 mm wide, as long as the sepals, often reflexed, clawed for about half the length, erose. Disc episepalously lobed, lobes separate or connate at the base, 0.2-0.3 mm long, thick, glabrous. Stamens 5; ca. 1 mm long, filaments fused at the base for 1/3 to 1/2 of their length, their free parts erect. Pistillode clavate to cylindrical, ca. 0.5 mm long, 0.2-0.3 mm wide, apex 3-lobed, lobes erect,

cylindrical to almost semiglobose, sometimes canaliculate adaxially, glabrous.

Pistillate flowers ca. 2 mm long, 2-3 mm wide. Bracts and buds as in staminate flowers. Pedicel terete, 10-20 mm long, ca. 0.3 mm wide, glabrous. Sepals 5, oblong to obovate, apex rounded, not thickened, ca. 1.5 mm long, 1-1.5 mm wide, entire, glabrous. Petals 5, spathulate, rounded, 1-1.2 mm long, 0.7-1 mm wide, slightly shorter than the sepals, often reflexed, clawed for about half the length, erose. Disc annular, episepalously lobed, margin erose, ca. 0.2 mm long, glabrous, thick. Ovary globose, ca. 1 mm long, glabrous. Styles 3, 2-fid to the base, their branches terete, ca. 0.3 mm long, ca. 0.1 mm wide, spreading, glabrous. Stigmas acute to truncate.

Fruits solitary or in twos, subglobose, 3-lobed, 6-8 mm long, 6-10 mm wide, glabrous, reticulate, light brown. Fruiting pedicels terete, (6-)10-25 mm long, 0.3-0.5 mm wide, glabrous. Columella 5-6 mm long, base and apex ca. 1 mm wide, thinner in the middle. Exocarp ca. 0.2 mm thick, reticulate on inner surface. Endocarp ca. 0.4 mm thick.

Seeds 1-2 per locule, ca. 7 mm long, 4-5 mm (1-seeded locules) or ca. 3 mm (2-seeded locules) wide, slightly shiny, light brown.

DISTRIBUTION.—Eastern Madagascar, humid bioclimatic zone (CORNET 1974).

ECOLOGY.—Eastern coastal forest, on sand and laterite; 10-1171 m.

VERNACULAR NAMES.—Zamalotra (*Rakotoniaina 2632-RN*).

ICONOGRAPHY: HOFFMANN & MCPHERSON, Novon 7: 250, Fig. 1A-D (1997), habit, leaf, flowers.

SPECIMENS EXAMINED.—MADAGASCAR: *Andrianarisata 109*, Toamasina, Réserve Naturelle Intégrale de Betampona, piste principale, 210-410 m, 22 Apr. 1994 (P!); *Badré 2074*, Antsiranana, 32 km au sud de Vohemar, à l'ouest de la route, 50-150 m, forêt, 26 Sep. 1988 (P!); *Capuron 24886-SF*, Est (Nord), environs Sud d'Antsirabe-Nord, sur la nouvelle route Vohémar-Sambava, 18 et 21 Oct. 1966 (P!); *Dumetz 1241*, Toliara, Prefecture de Tolanaro (Fort Dauphin), forêt dite Lakandava, 200 m, 25 Jan. 1990 (K!, MO, P!, TAN, TEF); *Dumetz & McPherson 1136*, Distr. Ft. Dauphin, Mandena Campement, 7 Dec. 1989 (MO!, P!, TAN, TEF); *McPherson 14407*, Toliara, Tolanaro (Ft. Dauphin) region, ca. 117 km N of city, ca. 7 km N of Mananenina, forest remnant called Analalava, laterite, 8 Nov. 1989 (MO!, P!, TAN, TEF); *McPherson et al. 14158*, Toliara, N of Ft. Dauphin (Tolanaro), St. Luce region, Manofiafy, 25 m, sand, coastal forest, 19 Oct. 1989 (MO!, P!, TAN!, TEF!); *McPherson et al. 14170*, Toliara, Tolanaro (N of Ft. Dauphin), St. Luce region (Manofiafy), 25 m, sand, coastal forest, 19 Oct. 1989 (MO!, P!, TAN, TEF); *McPherson & Dumetz 14651*, Toliara, Tolanaro (Ft. Dauphin), NE of town in coastal forest called Mandena, roadside forest E and beyond QIT camp, 25 m, 7 Dec. 1989 (B, DAV, K, MO!, P!, TAN, TEF), type; *Rabevohitra 1898*, Toliara, Prefecture de Tolanaro (Ft. Dauphin), Mandena (QIT-Fer), parcelle 4, 18 Apr. 1989 (MO!, P!, TAN, TEF); *Rabevohitra 2125*, Toliara, Préfecture de Tolanaro (Fort Dauphin), Mandena, 10 m, 13 Jan. 1990 (K!, MO!, P!, TAN, TEF); *Rajeriarison Euph 34*, Mandena (P!); *Rakotoniaina 2632-RN*, Tamatave, R.N. 1, 27 July 1950 (P!); *Rasoavimbahoaka 472*, Antsiranana, Marojejy RNI, Analamboahangy, Andrakata, Andapa, aux environs de Manenobasy, 14.35s 49.41e, 1171 m, forêt dense humide, 18-24 Jan. 1995 (P!); *Service des Eaux et Forêts 13918-SF*, Farafangana, Amporoforo, 26 July 1955 (P!); *Service des Eaux et Forêts 16270-SF*, Farafangana, J.B. No. 16, Manombo, Canton Ihorombé, latéritique avec concrétions, forêt côtière orientale (P!).

3. **Blotia mimosoides** (Baill.) Petra Hoffm. & McPherson, **comb. nov.**

Savia mimosoides Baill., Adansonia 2: 34 (1861); Étude Euphorb.: 573 (1858), nom. nud.; Müll. Arg. in DC., Prodr. 15(2): 230 (1866); Pax & K. Hoffm. in Engl., Pflanzenr., H. 81: 187 (1922); Leandri, Bull. Soc. Bot. France 84: 64 (1937); Notul. Syst. (Paris) 7: 190 (1939); Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 239 (1957), key only; in Humbert, Fl. Madagascar 111(1): 126 (1958).—*Petalodiscus mimosoides* (Baill.) Pax in Engl. & Prantl, Nat. Pflanzenfam. 3(5): 15 (1890).—Type: *Du Petit-Thouars s.n.*, s.loc. (lecto-, P!, here designated).

Savia hildebrandtii Baill. in Grandid., Hist. phys. Madagascar, Atlas 2: t. 209 (1892); Pax & K. Hoffm. in Engl., Pflanzenr., H. 81: 186 (1922); Leandri, Bull. Soc. Bot. France 84: 64 (1937); Notul. Syst. (Paris) 7: 189 (1939).—*Blotia hildebrandtii* (Baill.) Leandri, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 242 (1957); in Humbert, Fl. Madagascar 111(1): 134 (1958); Eg. Köhler, Grana Palynol. 6: 50 (1965).—Type: Baillon in Grandidier, Hist. phys. Madagascar, Plantes 4 (Atlas 2): t. 209 (1892). The material used for this plate was probably *Hildebrandt 3931*; *syn. nov.*

Savia maroando Danguy ex Lecomte, Bois d'Analamazaotra: 71 (1922); Danguy, Notul. Syst. (Paris) 5: 1 (1935); Leandri, Bull. Soc. Bot. France 84: 64 (1937); Notul. Syst. (Paris) 7: 189 (1939); in Humbert, Fl. Madagascar 111(1): 128 (1958), per syn.—Type: *Thouvenot (coll. Ramanantsvolana) 131*, Madagascar, Analamazaotra (lecto-, P!, chosen here; isolecto-, BM!, K!, P!, US!). Danguy (l.c.: 1, 1935) cited this collection as *Ramanantsvolana, Thouvenot & Fauchère 131*, but only the specimens in P bear all three collector's names, those in BM and US only that of *Thouvenot* and the one in K no collector's name at all.

Shrub or tree, 2-20 m tall. Young twigs terete, patulously hairy. Leaves elliptic, apex acute, rarely acuminate or obtuse, base acute, cuneate to attenuate, (0.5-)1.5-3(-4) cm long, 0.3-1.5 cm wide, glabrous, coriaceous or slightly chartaceous, light green to olive-green, dull to slightly shiny, midvein prominent on both sides, secondary venation usually not conspicuous compared with finer venation, finer venation scarcely prominent above, prominent beneath. Petiole ± canaliculate, 0.5-2 mm long, 0.6-0.7 mm wide, glabrous or patulously pilose. Stipules narrowly deltoid to linear, acute, 2-4 mm long, 0.5-1 mm wide, ± ciliate, otherwise glabrous, light brown to olive-green when dry.

Inflorescences axillary, flowers in fascicles of 3-12, borne directly in the leaf axils and/or on unbranched, leafless (sometimes some extremely reduced leaves present) axes up to 2 cm long; staminate and pistillate flowers together in the same inflorescence.

Staminate flowers 1.5-2.5 mm long, 2-4 mm wide. Bracts deltoid, acute, ca. 1 mm long, ca. 0.5 mm wide, glabrous or ciliate and hairy beneath. Buds globose, obtuse. Pedicel terete, 3-12 mm long, 0.2-0.3 mm wide, glabrous. Sepals 5-6, oblong to linear, rounded to obtuse, ca. 2 mm long, ca. 1 mm wide, with a slightly hyaline margin, sometimes ciliate, otherwise glabrous. Petals 5-6, spathulate to rhombic, rounded to obtuse, clawed for about half the length, erose, ca. 1 mm long, 0.5-1 mm wide, 1/2 to 2/3 as long as the sepals, glabrous, often reflexed; sometimes reduced to subulate processes. Disc annular, margin slightly episepalously crenate, undulate or nearly entire, ca. 0.2 mm long, thick, glabrous. Stamens 5; 0.5-1 mm long, filaments fused at the base for up to 1/3 of their length, terete, 0.8-1 mm long, anthers nearly globose, 0.3-0.4 mm long, glabrous. Pistillode clavate, not more than twice as long as wide, 0.5-0.7 mm long, ca. 0.5 mm wide, 3-fid for about half of its length, branches massive, rounded apically, canaliculate adaxially, erect, glabrous.

Pistillate flowers 1.5-2.5 mm long, 2-4 mm wide. Bracts as in staminate flowers. Buds globose to ellipsoid, obtuse. Pedicel terete, 3-12 (-15) mm long, ca. 0.3 mm wide, thickened distally, glabrous. Sepals 5-6, oblong to linear, rounded to obtuse, ca. 2 mm long, 0.5-1 mm wide, sometimes with a slightly hyaline margin, slightly ciliate, otherwise glabrous. Petals as in staminate flowers. Disc annular, margin irregularly crenulate to lacerate, sometimes lacerate to the base, up to 0.5 mm long, delicate, glabrous. Ovary ovoid, ca. 1 mm long, glabrous. Styles 2-fid to the base or slightly less, their branches terete, ca. 0.7 mm long, ca. 0.2 mm wide, recurved, glabrous. Stigmas obtuse to truncate, revolute.

Fruits solitary or up to 3 per inflorescence, subglobose, 3-lobed, rarely (in 4-carpellate fruits) 4-lobed, 7-9 mm long, 10-12 mm wide, glabrous, reticulate, medium to dark brown. Fruiting pedicels terete, 5-12(-20) mm long, 0.3-0.7 mm wide, glabrous. Columella 6-7 mm long, up to 1 mm wide in the middle, base not thickened, apex thickened to 1.5 mm. Exocarp ca. 0.1 mm thick, reticulate on inner surface. Endocarp ca. 0.3 mm thick.

Seeds 6-7 mm long, 6-7 mm (1-seeded locules) or 4-5 mm (2-seeded locules) wide, dull to slightly shiny, marbled, reddish brown.

NOTES.—Although there can be no doubt about the conspecifity of *Petalodiscus mimosoides* and *Blotia hildebrandtii*, both BAILLON and LEANDRI stated in their descriptions of *Savia mimosoides* that the sepals and petals are of equal length, while they considered the petals of *B. hildebrandtii* to be only half as long as the sepals. In fact, petals of a softened flower of the type of *P. mimosoides* are only 2/3 as long as the sepals, and hence fall within the variation of *B. hildebrandtii*.

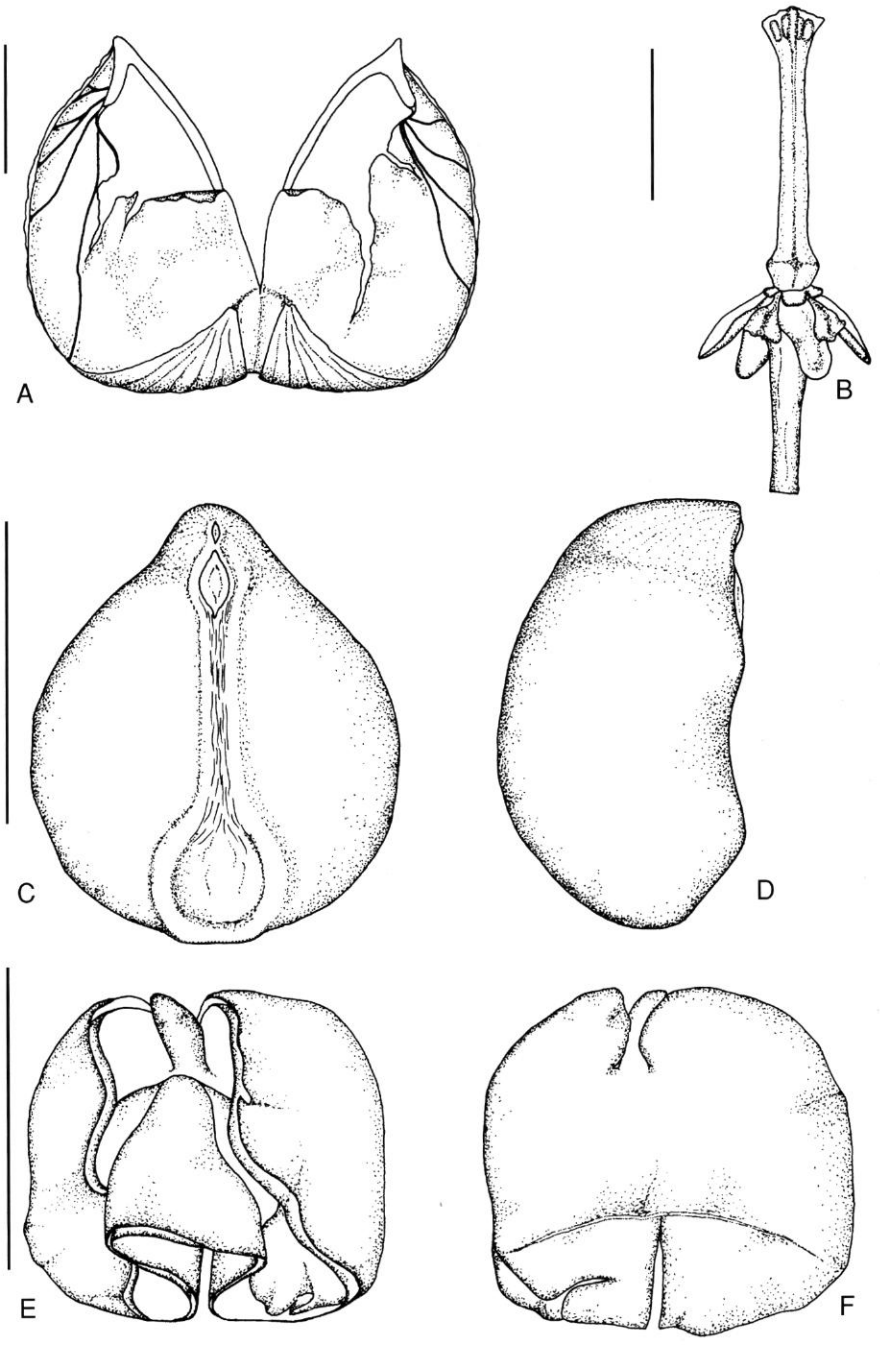

Fig. 3.—Fruit, seed and embryo of ***Blotia***. A-D, ***B. oblongifolia***: **A,** mericarp; **B,** columella with persistent perianth and aborted ovules; **C**, ventral view of seed with moderately developed perichalazal annulus; **D**, lateral view of seed. E-F, ***B. mimosoides,*** embryo from a 1-seeded locule: **E**, ventral view; **F**, dorsal view. A-B, *Service des Eaux et Forêts 6157-SF* (P), C-D *Capuron 8220-SF* (P); E-F *Baron 71* (P). Scale bar = 5 mm.

Besides *B. mimosoides,* the type sheet bears two sterile branches of one or two other taxa. For this reason, a lectotype excluding the two leftmost branches is here designated according to Art. 9.9 of the Tokyo Code.

DISTRIBUTION.—Madagascar, humid and subhumid bioclimatic zones of CORNET 1974 (eastern and central floristic domain). LEANDRI's observation (1958: 126) that this species seems to have been introduced to the Mascarenes is based upon a misidentification.

ECOLOGY.—Shady and dry forests; 350-1869 m.

VERNACULAR NAMES.—Beando (*Roberson 97-R-140*); Biandomadinidravina (*Raharimalala 2544*), Fanazava (*Capuron 18053-SF*), Fanjavala (*SF 1026, SF 1088, SF 1758, SF 1770, SF 3939, SF 6010, s.coll. 16-R-254, 21-R-304, 40-R-60, 49-R-497*; LEANDRI 1958: 135), Fanjavalahy (*SF 19016*), Fanjavoala (*SF 13006*; LEANDRI 1958: 135), Fotsinanaharey (*SF 1088*); Hazomfiasika (*SF 25877*), Hitsika (*Rahobisoa 9-R-274*), Karakaratiloho (*Raharimalala 2382*), Mampay à grandes feuilles (*s.coll. 38-R-195*); Maroando (*Perrier de la Bâthie 9648, SF 26166, s.coll. 84-R-72*; LECOMTE 1922: 71, LEANDRI 1958: 135), Menahy (*s.coll. 178-R-77*), Voandavenona (*SF 4048*; LEANDRI 1958: 135), Voatonakala (*SF 3574*; LEANDRI 1958: 135), Voretra (*SF 1715*).

ICONOGRAPHY.—BAILL. in GRANDID., Hist. Phys. Madagascar, Atlas 2: t. 209 (1892), habit, flower; LEANDRI in HUMBERT, Fl. Madagascar 111(1): 117, Fig. 19.9-11 (1958) flowering branch, diagram of pistillate flower, and 123, Fig. 20.12-14 (1958), flower.

SPECIMENS EXAMINED.—MADAGASCAR: *Baron 71*, Chiefly in Betsileo-land [Sud Betsileo, bois d'Ankafina, fide LEANDRI 1958], recd. at K: July 1880, purch. by P: 1889 (K!, P!); *Campenon s.n.*, s.loc., reçu le 20 Nov. 1889 (P!); *Capuron 11962-SF*, Forêt d'Ankaratra, versant Est du massif de l'Ankaratra, Apr. 1955 (K!, MO!, P!); *Capuron 18053-SF*, Centre-Est, Périnet, Analamazaotra, forêt, 30 July 1957 (K!, MO!, P!); *Capuron 18141-SF*, Est, Mahambo, au sud de Fénérive, sables, forêt sublittorale, 30 Aug. 1957 (K!, MO!, P!); *Capuron 18171-SF*, Est, au Nord du lac de Tampolo (Fénérive), sables, forêt sublittorale, 31 Aug. 1957 (K!, MO!, P!); *Capuron 18511-SF*, Est, Tsinjoarivo, à l'Est d'Ambatolampy, 30 Mar. 1958 (K!, P!); *Capuron 23782-SF*, Est, près d'Ambatoharanana (entre les embouchures de la Manambato et de l'Onive), sable, forêts littorales et sublittorales, 15 Nov. 1964 (K!, MO!, P!); *Capuron 23859-SF*, Centre, Massif du Vohibe-Autoetra, au S-SE d'Ambositra, 1600-1869 m, 1 Dec. 1964 (K!, MO!, P!); *Cours 4716*, Didy à Brickaville, forêt orientale, reçu 1954 (K!, MO!, P!); *Cours 4872*, Didy à Brickaville, forêt orientale, reçu 1954 (P!); *Dorr et al. 3221*, Tamatave, Environs d'Andasibe-Périnet, higher areas with *Weinmannia*, *Tambourissa*, low, moist areas with *Ficus*, 2-5 Nov. 1984 (K!, MO!, P!); *Du Petit-Thouars s.n.*, s.loc. (P!), type; *Geay 9062*, Tamatave, Distr. Fénérive, zone côtière, bois au S de l'Azafo (Azofo), 1909 (P!); *Geay 9063*, idem (P!); *Gouvernement de Madagascar 38*, Analamazaotra, 8 Dec. 1908 (MO!, P!), syntype of *Savia maroando*; *Herb. d'Alleizette 1306*, Côte Est, S de Tamatave, Nov. 1906 (P!); *Herb. d'Alleizette s.n. (5?)*, Est, forêt de l'Analamazaotra, Oct. 1905 (P!); *Hildebrandt 3931*, Süd-Betsileo, Wald von Ankafina, Feb. 1881 (A!, BM!, G!, M!, P!); *Jacquemin 1189*, Ft. Dauphin, forêt d'Esetra entre la scierie et la R.N. 12a, bord de ruisseau, 11 Dec. 1972 (P!); *Jacquemin H216J*, Tamatave, Piste de Fotsialanana à Ampasiventy, 23 Oct. 1966 (P!); *McPherson 14419*, Toliara, 117 km N of Fort Dauphin and 7 km N of Manantenina, 50 m, 8 Nov. 1989 (MO!); *Perrier de la Bâthie 9620*, Est, forêt d'Analamazaotra, 800 m (K!, P!); *Perrier de la Bâthie 9648*, Est/Centre, Analamazaotra, 800 m, forêt (MO!, P!); *Perrier de la Bâthie 17209*, Centre, bois Tsinjoarivo, 1400 m, Feb. 1925 (P!); *Raharimalala 2382*, Saharamy de Verezanantsoro, Fir. Mananara Nord, 350 m, forêt ombrophile, 14 Oct. 1990 (P!); *Raharimalala 2544*, forêt de Varary, au sommet d'une colline au SW du village, forêt entourée de Savoka à "Longoza", 6 Nov. 1990 (P!); *Rakoto 338*, Fianarantsoa, Ranomafana, Parcelle II, 21°16'S, 47°21'E, 1080-1150 m, 24 Nov. 1992 (MO!, P!); *Rakotomalaza et al. 699*, Fianarantsoa, forêt d'Ambalahambana, 1770 m, 29 Mar. 1996 (MO!); *Rahobisoa 9-R-274*, Tamatave, forêt Manoandrivotra, Antetazambaro, 29 Sep. 1954 (P!); *Roberson 97-R-140*, Antalaha, canton Ampanavoana, forêt du Ankalampona, 22 Apr. 1951 (P!); *Service des Eaux et Forêts 1026-SF*, Tsinjoarivo, Ambatotsipihina, bord ruisseau, 19 Dec. 1949 (P!); *Service des Eaux et Forêts 1088-SF*, Périnet, Sahamamy, 10 Jan. 1950 (P!); *Service des Eaux et Forêts 1715-SF*, Ambatondrazaka (P!); *Service des Eaux et Forêts 1758-SF*, Angodona, Tsinjoarivo, 5 June 1950 (P!); *Service des Eaux et Forêts 1770-SF*, Tsinjoarivo, Angodona, 5 June 1950 (P!); *Service des Eaux et Forêts 3574-SF*, Tamatave, Antanetilava, Res. Nat. No. 1, 12 June 1951 (P!); *Service des Eaux et Forêts 3939-SF*, Tsinjoarivo, Antandrokomby, 20 July 1951 (P!); *Service des Eaux et Forêts 4048-SF*, Est, entre Ambatondrazaka et

Befody, forêt de l'Est, 29 Aug. 1951 (P!); *Service des Eaux et Forêts 6010-SF*, Tsinjoarivo, Ambatolampy, 2 July 1952 (P!); *Service des Eaux et Forêts 13006-SF*, forêt Ambomitsara, Anjamanga, Ambatolampy, 16 Dec. 1954 (P!); *Service des Eaux et Forêts 19016-SF*, Moramanga, canton Périnet, Analamazaotra, 800 m, latéritique, forêt dense humide, 23 Apr. 1958 (P!); *Service des Eaux et Forêts 25877-SF*, Moramanga, Solafana, Teoby P.K. 24 route d'Anosibe, 900 m, latêro-humifère, forêt sèche, 16 Nov. 1965 (MO!, P!); *Service des Eaux et Forêts 26166-SF*, Mangabe, Ampasimaventy, Andranomanapika, latéritique très couvert d'humus, 23 Oct. 1966 (MO!, P!); *Thouvenot* (*coll. Ramanantsvolana*) *131*, Analamazaotra, 8 Feb. 1920 (BM!, K!, P!, US!), type of *Savia maroando*; *s.coll. 3-R-179*, Ananalava, Ambohimahasoa, 23 Dec. 1951 (P!); *s.coll. 16-R-254*, Ambositra, canton Ivato, forêt Lehimena, 19 Apr. 1953 (P!); *s.coll. 21-R-304*, Ambatolampy, canton Tsinjoarivo, forêt de Tsinjoarivo, Ambohikambana village, flanc de colline, terrain sableux (P!); *s.coll. 38-R-195*, Tamatave, canton Ambodilazana, forêt de Sahasy, sommet de colline, sol argile, 8 Mar. 1956 (P!); *s.coll. 84-R-72*, Distr. Fénerive, Ambahoabe, Poste de Soanierana-Ivongo (P!); *s.coll. 84-R-107*, Antevialambazaha, Mananara, 16 Dec. 1951 (P!); *s.coll. 40-R-60*, canton and district Ambositra, forêt d'Ivanana, 8 Mar. 1952 (P!); *s.coll. 178-R-77*, Menagisy, Brickaville, 7 Apr. 1954 (P!).

4. **Blotia oblongifolia** (Baill.) Leandri

Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 240 (1957); in Humbert, Fl. Madagascar 111(1): 132 (1958); Punt, Wentia 7: 34 (1962) pollen; Levin, Ann. Missouri Bot. Gard. 73: 40, 41 (1986); Muller et al., Trop. Subtrop. Pflanzenwelt 67: 84 (1989).—*Savia oblongifolia* Baill., Adansonia 2: 35 (1861); Müll.Arg. in DC., Prodr. 15(2): 229 (1866); Pax & K. Hoffm. in Engl., Pflanzenr., H. 81: 187 (1922); Lecomte, Bois d'Analamazaotra: 71 (1922); Leandri, Bull. Soc. Bot. France 84: 64 (1937); Notul. Syst. (Paris) 7: 190 (1939).—*Wielandia oblongifolia* Baill., Étude Euphorb.: 569 (1858), nom. nud.—*Petalodiscus oblongifolius* (Baill.) Pax in Engl. & Prantl., Nat. Pflanzenfam. 3(5): 15 (1890), «*oblongifolia*».—Type: *Boivin 1886*?, Madagascar, Ste.-Marie de Madagascar, forêt de Tafondrou (lecto-, P!, chosen here; isolecto-, P!).

Savia decaryi Leandri, Bull. Soc. Bot. France 81: 589 (1934); Notul. Syst. (Paris) 7: 190 (1939), per syn.—*Savia oblongifolia* Baill. var. *decaryi* Leandri, l.c., "per sp.".—Type: *Decary 6389*, Madagascar, Ambila, au sud de Tamatave (lecto-, P!, chosen here; isolecto-, K!, US!).

Tree or shrub, 2-20 m tall. Young twigs terete, glabrous. Leaves persistent, oblong to elliptic, rarely slightly ovate, apex acuminate to acute, base acute to obtuse, rarely rounded, rarely slightly auriculate, (4-)6-14(-30) cm long, 1.5-4.5(-7) cm wide, glabrous, coriaceous, light green to olive-green, shiny, rarely bullate, midvein prominent on both sides, secondary venation conspicuous compared with finer venation, finer venation scarcely prominent above, prominent beneath. Petiole canaliculate, 3-10 mm long, 1-1.5 mm wide, glabrous. Stipules narrowly deltoid to linear, acute, 3-7(-25) mm long, 0.5-1.5(-2.5) mm wide, glabrous, light brown to olive-green when dry, but mostly broken off.

Inflorescences axillary and cauline on the same plant, staminate and pistillate flowers together in fascicles of ca. 10-15, borne directly in the leaf axils or on unbranched, leafless axes less than 1 cm long. Flowers reddish.

Staminate flowers ca. 2 mm long, 3-4 mm wide. Bracts deltoid, acute, ca. 1 mm long, ca. 0.5 mm wide, glabrous or ciliate and hairy beneath. Buds globose, obtuse. Pedicel terete to flat, 7-22 mm long, 0.2-0.3 mm wide, glabrous. Sepals 5, linear to elliptic, rounded, more rarely obtuse to acute, ca. 2 mm long, 0.5-1 mm wide, with a slightly hyaline margin, apex rarely with some hairs, otherwise glabrous. Petals 5, spathulate to rhombic, rounded to obtuse, clawed for about half the length, erose, ca. 2 mm long, 0.7-1 mm wide, about as long as the sepals, glabrous, often reflexed. Disc annular, margin slightly episepalously crenate, undulate or nearly entire, ca. 0.2 mm long, thick, glabrous. Stamens 5; 1-1.5 mm long, filaments fused at the base for 1/3 to 1/2 of their length, terete, 0.8-1.3 mm long, anthers nearly globose, reflexed (ca. 90°), 0.2 mm long, glabrous, base of anther cells usually separated by the expanded filament. Pistillode clavate, not more than twice as long as wide, 0.5-0.7 mm long, 0.3-0.5 mm wide, 3-fid for half of its length, branches massive, rounded apically, canaliculate adaxially, erect, glabrous.

Pistillate flowers ca. 2 mm long, 3-4 mm wide. Bracts and buds as in staminate flowers. Pedicel terete to flat, 7-22 mm long, 0.3-0.5 mm wide, thickened distally, glabrous. Sepals 5, deltoid to oblong, rounded, rarely obtuse to acute, ca. 2 mm long, 1-1.5 mm wide, with a slightly hya-

line margin, glabrous. Petals and disc as in staminate flowers. Ovary ovoid, ca. 1 mm long, glabrous. Styles 2-fid to the base or slightly less, their branches terete, ca. 0.5 mm long, ca. 0.2 mm wide, nearly straight, erect to horizontally spreading, glabrous. Stigmas acute to truncate.

Fruits reddish, solitary or up to 3 per inflorescence, subglobose, 3-lobed, 10-13 mm long, 14-16 mm wide, glabrous, reticulate, medium to dark brown. Fruiting pedicels terete, 7-25(-30) mm long, ca. 0.7 mm wide, glabrous. Columella 7-11 mm long, ca. 1 mm wide in the middle, base scarcely thickened, apex thickened to 2 mm. Exocarp 0.2-0.3 mm thick, reticulate to verrucate on inner surface. Endocarp 0.7-1 mm thick.

Seeds 1-2 per locule on the same plant, ca. 7 mm long, ca. 7 mm (1-seeded locules) or 4-5 mm (2-seeded locules) wide, dull to slightly shiny, ± marbled, medium to reddish brown.

DISTRIBUTION.—Eastern Madagascar, humid and transition to subhumid bioclimatic zone (CORNET 1974).

ECOLOGY.— Humid and subhumid forests; 0-800 m.

VERNACULAR NAMES.—Faniavala (LEANDRI 1958: 133), Fanjavala *(Gouvernement de Madagascar 93, SF 1811, SF 3705, SF 3839, SF 6057, SF 10346, SF 10357, SF 12167)*, Fanzavala (*Perrier de la Bâthie 5286*), Fotsinanahary (*SF 4363, SF 26836*; LEANDRI 1958: 133), Haraharatoloho (*Raharimalala 2142*), Hazomena (*Rakotovao 8524*), Hazompantsika (Leandri 1958: 133), Hazompasika *(Gouvernement de Madagascar 20, Service de Colonisation (Randrianasolo coll.) 53 = Thouvenot s.n.*, 1918; LECOMTE 1922: 71, LEANDRI 1958: 133), Hazondramoka (*Razanaparany 8225-RN, Razanaparany 8515-RN*); Hompamena (*SF 21431*), Kotrofotsy (LEANDRI 1958: 133), Maroandrano (*SF 13824*; LEANDRI 1958: 133), Menatoraka [dial. Taisaka] (*SF 16262*), Pitsikahitra (*Ratovoarison 21318-SF*), Tanatanampotsy (*SF 6157, Zafindraboto 199 (69-SF)*; LEANDRI 1958: 133).

ICONOGRAPHY.—BAILL. in GRANDID., Hist. phys. Madagascar, Atlas 2: t. 208 (1892), habit, flower; Levin, Ann. Missouri Bot. Gard. 73: 41: Fig. 5, 6 (1986), leaf venation; MULLER et al., Trop. Subtrop. Pflanzenwelt 67: 63, Fig. 7-15 (1989), pollen.

SPECIMENS EXAMINED.—MADAGASCAR: *Andrianarisata 173*, Toamasina, Réserve Naturelle Intégrale de Betampona, piste principale, piste Sahabefoza, piste Betakonana, 17°55'S, 49°13'E, 210-410 m, 29 Apr. 1994 (MO!, P!); *Andrianarisata et al. 227*, Toamasina, Réserve Naturelle Intégrale de Betampona, entre les points kilometriques 1 et 2, 300-400 m, 5 Oct. 1994 (MO!, P!); *Boivin 1886*, forêt de Tafondrou, "Ste.-Marie de Mad.", 1849 (P!), type; *Capuron 822-SF*, Est, Vallée de l'Androranga (bassin de Bemarivo N.E.), flancs sud de Betsomanga, 690 m, 17 Nov. 1950 (K!, MO!, P!); *Capuron 18134-SF*, Est, Tamatave, Réserve Naturelle no. 1, Ambodiriana, 250-500 m, 23 Aug. 1957 (K!, P!); *Capuron 23638-SF*, Est, Farafangana, forêt de Manombo, au Sud de Farafangana, latérite de basalte, 17 Oct. 1964 (K!, MO!, P!); *Decary 6389*, Ambila, S de Tamatave, clairière de forêt littorale, 2 Feb. 1926 (K!, P!, US!), type of *Savia decaryi*; *Gouvernement de Madagascar 20*, s.loc. (P!); *Lewis et al. 824*, Fianarantsoa, Andringitra, ca. 45 km S of Ambalavao, 720 m, 15-21 Nov. 1993 (MO!); *Louvel (Herb. forestier de Madag.) 93*, forêts montagneuses de l'Est (P!); *Lowry et al. 4490*, Toamasina, Ambanizana, on the Masoala Peninsula, ca. 30 km SE of Maroantsetra; trail leading from S of the village E into the mountains, 500 m, open area near a wind fall in dense, wet forest, 13 May 1988 (P!, MO!); *Perrier de la Bâthie 4472*, Est/Centre, Analamazaotra, 800 m, bois, Feb. 1913 (P!); *Perrier de la Bâthie 5286*, Est, forêt d'Analamazaotra, 800 m (K!, MO!, P!); *Rahajasoa et al. 824*, Antsiranana, Parc National de Masoala, Andrombazaha, 15°16' S, 50°29' E, 0 m, 10 Oct. 1994 (P!); *Raharimalala 2142*, Verezanantsoro, 570 m, forêt ombrophile, 8 Oct. 1990 (P!); *Rakotovao 8524*, Farafangana, canton Ivongo, 16 Dec. 1956 (P!); *Ratovoarison (R172) 32F = 21318-SF*, Moramanga, canton Périnet, Antsampandrano, forêt primaire sur la flanc, 9 Nov. 1962 (P!); *Service de Colonisation (coll. Randrianasolo) 53* [additional label: *Thouvenot s.n.*, 1918], Analamazaotra, 1918 (K!, P!); *Service des Eaux et Forêts 1811-SF*, Périnet, 7 Feb. 1950 (P!); *Service des Eaux et Forêts 3705-SF*, Périnet, Sahamaloto, 19 July 1951 (P!); *Service des Eaux et Forêts 3839-SF*, Périnet, Sahamaloto, 10 July 1951 (P!); *Service des Eaux et Forêts 4363-SF*, Périnet, Beravina, Antsahatsaka, 2 Aug. 1951 (P!); *Service des Eaux et Forêts 6057-SF*, Périnet, Sahamaloto, 18 Oct. 1952 (MO!, P!); *Service des Eaux et Forêts 6157-SF*, Jardin Botanique 17, Maroantsetra, 2 Oct. 1952 (K!, MO!, P!); *Service des Eaux et Forêts 10346-SF*, Périnet, 19 May 1954 (K!, P!); *Service des Eaux et Forêts 10357-SF*, Moramanga, Périnet, Sahamaloto, 29 Apr. 1954 (P!); *12167-SF*, Périnet, Sahamaloto, 21 Aug. 1954 (P!); *Service des*

Eaux et Forêts 13824-SF, Ifanadiana, forêt Ambatolahiambo, 8 Mar. 1955 (P!); *Service des Eaux et Forêts 16262-SF*, Farafangana, canton Evato, Amporoforo, forêt d'Analavory, latéritique, en lisière de forêt (P!); *21431-SF*, Fénerive, Tanamarina, Tsinjoarivo, 4 Oct. 1963 (P!); *26836-SF*, Moramanga, P.K. 27-28 route Moramanga-Anosibe, forêt sèche, 10 Jan. 1969 (K!, MO!, P!); *Thouvenot 5*, Analamazaotra, 1918 (A!, P!); *Ursch 10 (16?)*, Analamazaotra, 3 Dec. 1934 (P!); *Ursch 63*, idem (P!); *s.coll. 198-RN*, Fénerive, canton Ambodiampana, Ambahoabe (P!); *Razanaparany 8225-RN*, Tamatave, Ambodiriana, 2 Mar. 1956 (P!); *Razanaparany 8515-RN*, Tamatave, canton Ambodiriana, 19 Nov. 1956 (P!); *Zafindraboto 69-R-199*, Jardin Botanique de Maroantsetra (P!);

SPECIMENS WITH BULLATE LEAVES.—*Cours 1195* = *TAN 4344* = *O-299*, Distr. Ambatondrazaka, Lac Alaotra (A-299) (P!); *Jacquemin H568J*, Route Andapa-Doany-vallée de l'Andranotsara, 24 Oct. 1967 (P!); *Perrier de la Bâthie 2077*, Côte Est, environs baie d'Antongil, 500 m, bois, 1912 (P!).

SPECIMENS WITH EXCEPTIONALLY LONG LEAVES.—*Capuron 28070-SF*, Est, forêt d'Analalava, à l'Ouest de Foulpointe, sur latérites, 19 Dec. 1967 (K!, P!); *s.coll. 22-R-72*, Fénérive, Poste de Soanierana-Ivongo, Ambahoabe, Apr. 1950 (P!).

Capuron 28070-SF differs from all other *Blotia* collections in its larger (15-30 × 3-7 cm), narrowly ovate leaves with an acute to only very slightly acuminate apex and an auriculate base. The stipules are only ca. 5 × 1 mm in size. The (staminate) flowers are identical to those of *B. oblongifolia*. The specimen *s.coll. 22-R-72* is an intermediate between a typical *B. oblongifolia* and *Capuron 28070-SF*: leaves 12-20 × 3-5 cm, leaf base not auriculate and stipules large (20 × 2.5 mm). More material is needed to decide upon the status of these collections.

5. **Blotia tanalorum** Leandri

Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 243 (1957); in Humbert, Fl. Madagascar 111(1): 131 (1958).—Type: *Decary 5104*, Madagascar, prov. Farafangana, Ivohibe, bord de chemin (lecto-, P!, chosen here; isolecto-, K!,).

Tree or shrub, 2-10 m tall. Young twigs terete, glabrous or patulously hairy. Leaves elliptic to oblong, rarely ovate, apex acuminate to acute, base acute, sometimes attenuate, ± auriculate, (2.5-)4-9(-12) cm long, (1.5-)2-3.5(-4.5) cm wide, glabrous, chartaceous, greyish to light green, dull, midvein prominent on both sides, secondary venation usually not conspicuous compared with finer venation, finer venation scarcely prominent above, prominent beneath. Petiole terete, not canaliculate, 2-4 mm long, 0.8-1.5 mm wide, glabrous or patulously hairy. Stipules narrowly deltoid to linear, acute, 3-4 mm long, ca. 1 mm wide, glabrous, light brown to olive-green when dry.

Inflorescences axillary and cauline on the same plant, staminate and pistillate flowers together in fascicles of ca. 5-30, borne directly in the leaf axils or more rarely on unbranched, leafless axes less than 1 cm long.

Staminate flowers 3-5 mm long, 4-6(-7) mm wide, very delicate. Bracts deltoid, acute, 1-1.5 mm long, 0.5-1 mm wide, glabrous. Buds ovoid to ellipsoid, acute. Pedicel terete, 10-20 mm long, 0.1-0.2 mm wide, glabrous. Sepals 5, rarely 4, deltoid to ovate, acute, 2-3 mm long, 1-2 mm wide, erose, apex thickened and with some hairs beneath, otherwise glabrous, membranaceous. Petals 5, rarely 4, nearly elliptic to spathulate, clawed only at the base, erose, 4-5 (-6) mm long, 2-3 mm wide, three times to only a little longer than the sepals, glabrous, membranaceous (LEANDRI 1957: 244; 1958: 128, 132) described the staminate petals as being fused at the base, but this observation could not be confirmed in the present study. However, the delicate perianth is usually compressed and completely stuck together when dry, so that the individual parts can hardly be separated from each other). Disc annular, margin crenate, undulate or nearly entire, lobes episepalous, rounded or retuse, 0.3-0.8 mm long, thin, glabrous. Stamens 5, rarely 4; 1.5-2 mm long, filaments fused at the base for at least 2/3 of their length, terete to flat, 1.3-1.8 mm long, anthers nearly globose, basi- to ventrifix, reflexed (90-180°), 0.2 mm long, glabrous, base of anther cells usually separated by the expanded filament. Pistillode cylindrical, more than three times longer than wide, 1-1.5 mm long, ca. 0.2-0.3 mm wide, 3, rarely 4-fid for half of its length, its branches subulate, sometimes 2-fid for half of their length, erect to horizontally spreading, glabrous.

Pistillate flowers 3-6 mm long, 4-6 mm wide, delicate. Bracts and buds as in staminate flowers. Pedicel terete, 5-25 mm long, 0.2-0.3 mm wide,

glabrous or patulously hairy. Sepals, petals and disc as in staminate flowers. Ovary globose to ovoid, 0.5-1 mm long, glabrous. Styles 2-fid to the base or slightly less, their branches terete, ca. 0.5 mm long, 0.1-0.2 mm wide, nearly straight, erect to horizontally spreading, glabrous. Stigmas acute to truncate.

Fruits solitary, nearly globose, 3-lobed, 8-9 mm long, 8-9 mm wide, glabrous, reticulate, medium to light brown. Fruiting pedicels terete, 9-15 mm

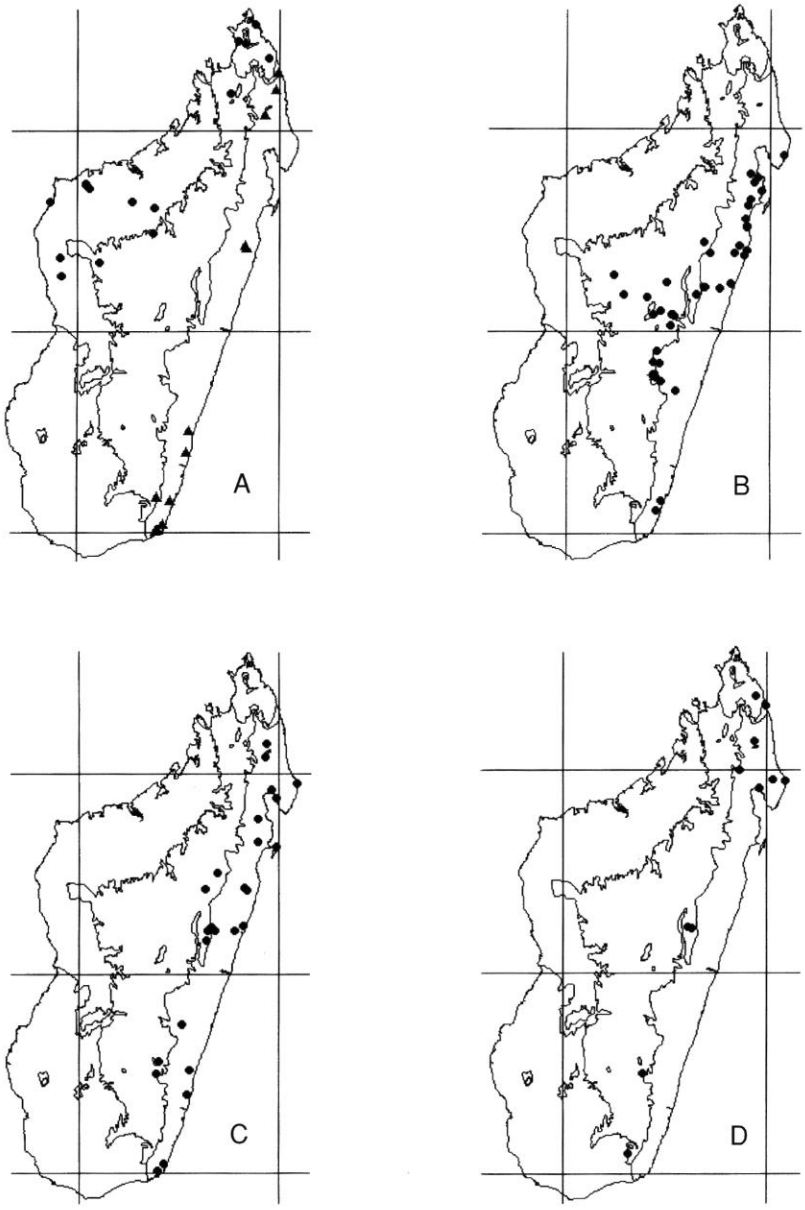

Fig. 4.—Distributions of ***Blotia***, mapped on the bioclimatic zones of Madagascar (after CORNET 1974). **A**, ***B. bemarensis*** (circles) and ***B. leandriana*** (triangles); **B**, ***B. mimosoides***; **C**, ***B. oblongifolia***; **D**, ***B. tanalorum***.

long, 0.5 mm wide, glabrous or patulously hairy. Columella 9-10 mm long, ca. 0.6 mm wide in the middle, base scarcely thickened, apex thickened to 1 mm. Exocarp ca. 0.2 mm thick, reticulate to almost smooth on inner surface. Endocarp 0.4-0.5 mm thick.

Seeds 1-2 per locule, 8-9 mm long, 6-7 mm (1-seeded locules) or 3-4 mm (2-seeded locules) wide, dull, marbled, brown.

DISTRIBUTION.—Eastern Madagascar, transition of humid and subhumid bioclimatic zone (CORNET 1974).

ECOLOGY.— Humid and subhumid forests; 0-800 m.

VERNACULAR NAMES.—Hazondamokana (*SF 7884, Zata 4439-RN*).

ICONOGRAPHY.—LEANDRI, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 8: 241, Fig. 7. (1957), habit, flower; LEANDRI in HUMBERT, Fl. Madagascar 111(1): 127, Fig. 21 (1958), habit, flower, more elaborate version of the same drawings.

SPECIMENS EXAMINED.—MADAGASCAR: *Bernard et al. 64*, Antalaha, Ambohitralalana (Cap-Est), Tanandavahely, Ouest d'Ambato, 15°18'S, 50°29'E, 0-15 m, 12 Oct. 1994 (P!); *Capuron 748-SF*, distr. Sambava, flanc S de L'Anjenabe, vallée de l'Androranga, 800 m (MO!, P!); *Capuron 27298-SF*, Est (Nord), au S de Vohémar, forêt littorale, 11-19 Dec. 1966 (P!); *Decary 5104*, Farafangana, Ivohibe, bord de chemin humide, 1 Oct. 1926 (K!, MO!, P!), type; *Humbert & Capuron 24041*, vallée inférieure de l'Androranga, affl. de la Bemarivo (nord-est) aux environs d'Antongodriha, Mont Anjenabe, 500-600 m, gneiss forêt ombrophile, 3-7 Nov. 1950 (K!, MO!, P!); *Jacquemin 1120*, vestige forestier au P.K. 100, avant Moramanga, 2 Nov. 1972 (P!); *McPherson 14718*, Diego Suarez region, SE of town and SE of Ambilobe, near Daraina on road to Vohemar (Iharana) (D. Meyer's lemur study site), 200-250 m, forest, 19 Dec. 1989 (MO!, P!); *Rajeriarison Euph 37*, Moramanga (P!); *Rakotoson 8189-RN*, Fort Dauphin, Enaniliha, 21 Oct. 1956 (MO!, P!); *Rakoto 8929-RN*, Farafangana, Ivohibe, W of Farafangana, 17 Sep. 1956 (P!); *Service des Eaux et Forêts 7884-SF*, Bealanana, Ankiabe, forêt Belalitra, 12 Sep. 1953 (P!); *Zata 4439-RN*, Antalaha, Ambohitralanana, R.N. 2 (MO!, P!).

EXCLUDED NAME

Blotia oblongifolia (Baill.) Leandri var. *louvelii* Leandri, Notul. Syst. (Paris) 7: 190 (1939), "*louveli*"; in HUMBERT, Fl. Madagascar 111(1): 133 (1958).—Type: *Louvel 77*, Madagascar, Analamazaotra (holo, P!).—The three collections this variety is based on belong to *Savia danguyana*, which LEANDRI described 18 years later (1957: 239) with a different type. In 1958, LEANDRI cited the holotype and two paratypes of *Blotia oblongifolia* var. *louvelii* both under this name (p. 134) and under *Savia danguyana* (p. 120).

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