A taxonomic revision of the Malagasy endemic genus *Micronychia* (Anacardiaceae)

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ABSTRACT
A taxonomic revision of *Micronychia* Oliv. (Anacardiaceae: Rhoideae) is presented, a genus of trees and shrubs endemic to Madagascar. A key and descriptions are provided, and distribution, habitat and phenology of each species are also discussed. Five species and one variety are recognized, one of which is described as new, *M. acuminata* Randrianasolo, which is easily distinguished from the other members of the genus by its small and long acuminate leaves.

KEY WORDS
Micronychia,
Anacardiaceae,
endemic,
Madagascar.

RÉSUMÉ
Révision taxonomique du genre Micronychia (Anacardiaceae) endémique de Madagascar.
Révision de *Micronychia* Oliv. (Anacardiaceae : Rhoideae), genre endémique de Madagascar représenté par des arbres et des arbustes. Une clé de détermination, les descriptions des espèces ainsi que des informations sur leurs distribution, habitat et phénologie sont aussi présentées. Cinq espèces (dont une nouvelle) et une variété sont reconnues. La nouvelle espèce, *M. acuminata* Randrianasolo, se distingue facilement des autres espèces de *Micronychia* par ses feuilles qui sont petites et longuement acuminées.

MOTS CLÉS
Micronychia,
Anacardiaceae,
endémique,
Madagascar.

INTRODUCTION

Micronychia Oliv. is a small genus of Anacardiaceae endemic to Madagascar. According to the infrafamilial classifications of ENGLER (1892) and BARCLEY (1957), it is placed in Rhoideae (or Rhoeae), the largest of the five tribes in Anacardiaceae. When *Micronychia* was first described, it comprised only one species, but in its most recent revision by PERRIER DE LA BÂTHIE (1946) as part of his treatment for the Flore de Madagascar, the number of species was increased to five. PERRIER's work was a tremendous contribution to the knowledge of this group, but is now outdated. As more specimens have accrued for study, some inaccuracies have become evident in his species descriptions and his identification key for *Micronychia* is inadequate. For example, observations in the field show that *Micronychia* species are dioecious rather than polygamodioecious as PERRIER DE LA BÂTHIE previously reported. A revisionary study of the *Micronychia* group was conducted as part of a doctoral dissertation project. The objectives were to understand better patterns of character variation in *Micronychia* in order to establish improved species descriptions, to develop improved species circumscriptions, and to provide an unambiguous key for species identification. The present paper contains a new taxonomic treatment of *Micronychia* resulting from this study.

The Malagasy genera of Anacardiaceae are divided into two groups based on characters of their leaf structure: compound imparipinnate versus simple leaves. *Micronychia*, along with *Gluta* L., *Campnosperma* Thwaites, *Protorhus* Engl. and *Rhus* sect. *Baronia* (Baker) H. Perrier, form the simple leaved group. However, *Micronychia* can be differentiated from these genera by the following characters: pendent axillary or terminal inflorescences bearing red or pink tetra- or pentamerous flowers, stamens with sigmoid and long filaments, a unilocular ovary with an almost gynobasic and a long trifid style bearing three capitate stigmas.

In addition, species of *Micronychia* have a very characteristic phenology, flowering during winter (May-July) as opposed to the rest of Malagasy Anacardiaceae species whose flowering period is primarily in spring (September-October).

With regard to geographic distribution, following the phytogeographic subdivisions established by HUMBERT (1955), species of *Micronychia* are mainly found in the eastern region, from coastal forests on sand at sea level to humid forests of the high plateau (1,500 m).

MATERIALS AND METHODS

The revision presented here was based on study of herbarium specimens borrowed from P and examined in place at MO, NY, TAN, TEF, as well as material collected in the field in Madagascar. Herbarium acronyms follow HOLMGREN et al. (1990). The descriptive terminology used is based on RADFORD et al. (1974), HICKEY (1973), and HARRIS et al. (1994), and the terminology used to describe the type, position and stature of inflorescence is based on WABERLING (1989). Parallel descriptions of species were prepared with Delta System edition 4.0 (DALLWITZ et al. 1996), and distribution maps were prepared with Arc View version 3.1 GIS software.

MICRONYCHIA Oliv.

Hook. Icon. Pl., ser. 3, 14: 27 (1881).

TYPE. — *Micronychia madagascariensis* Oliv.

Dioecious trees 3-20 m tall. Leaves alternate, simple, coriaceous, subcoriaceous or chartaceous, persistent, venation pinnate and craspedodromous or camptodromous, midvein prominent on the undersurface, secondary veins arcuate and prominent on the undersurface, forming an obtuse angle with the midrib toward leaf base. Inflorescence an axillary, subterminal or terminal, pendent panicle, pubescent. Flowers 5-merous, rarely 4- or 6-merous, unisexual, red or pink; calyx imbricate; corolla much larger than calyx, imbricate or quincuncial; stamens alternipetalous, the filament inserted basally on the outer surface of the disk, glabrous, sigmoid or reverse S-shaped (except in *M. tsiramiramy*) and long in male flowers, short, flattened, and broadened at the base in female flowers; anthers glabrous, dorsifixed, introrse, dehiscent by longitudinal slits, much smaller and sterile in female flowers; disk glabrous, dish-shaped in

male flowers, annular and cup-shaped in female flowers; ovary unilocular, with one anatropous ovule with a long funicle, placentation parietal; the single long, trifid, lateral style with 3 capitate stigma lobes. Fruit drupaceous, one seeded, glabrous but with longitudinal striations, mesocarp resinous, pyrene with two well separated cotyledons.

Key to the species of *Micronychia*

1. Leaves with both surfaces glabrous; filaments straight, not exceeding 2 mm in length; style straight and short, up to 1.5 mm in length 2
1'. Leaves with at least one surface pubescent; filaments sigmoid, more than 4 mm in length; style curved, exceeding 3 mm in length 3
2. Leaf apex long acuminate ..... **M. acuminata**
2'. Leaf apex rounded, retuse or emarginate ..... **M. tsiramiramy**
3. Leaf blade oblanceolate, base decurrent ..... **M. macrophylla**
3'. Leaf blade obovate to elliptic, base not decurrent 4
4. Treelets 3 m tall; leaves 4-9 cm long, 2-4.5 cm wide, with 8-13 pairs of craspedodromous secondary veins .... **M. madagascariensis**
4'. Trees 6-9 m; leaves 8.5-22 cm long, 4.5-11 cm wide, with 20-25 pairs of camptodromous secondary veins .. .. **M. danguyana**

Micronychia acuminata Randrianasolo, **sp. nov.**

Haec species a congeneris foliis oblanceolatis ad anguste ellipticus parvis (2.8-6.5 cm longis, 1-2 cm latis) atque apice acuminato logissimus 1-1.5 cm) differt.

TYPUS. — *SF 18114 (Capuron)*, Madagascar, Toamasina Prov.: RNI n° 1 Betampona, Ambodiriana, 250-500 m, 22 Aug. 1957, fr. (holo-, P!; iso-, P!, TEF).

Trees or treelets; young twigs glabrous, with lenticels. Leaves subcoriaceous, persistent; blades oblanceolate to narrowly elliptic, 2.8-6.5 cm long, 1-2 cm wide, apex acuminate (acumen 1-1.5 cm long), base acute, decurrent, margin entire; adaxial and abaxial surfaces glabrous; venation pinnate and mixed craspedodromous, midvein prominent below, 10-12 pairs of secondary veins, 2-8 mm apart, more or less parallel to arcuate, slightly prominent below, forming an obtuse angle with the midrib at leaf base, tertiary veins ramified and admedial. Petiole 3-4 mm long, shallowly channeled, glabrous. Male and female flowers unknown. Infrutescence terminal, ca. 2.5 cm long, branches regular, glabrous. Fruit 1-1.4 cm long, 0.9-1.2 cm broad, asymmetrical, mango-shaped, with longitudinal striations, glabrous, mesocarp resinous, endocarp thin. — Fig. 1.

From observation of the available specimens, and despite the fact that the flowers are unknown, this species is strikingly different from the other members of *Micronychia* by its very long acuminate leaf apex (Fig. 1). Dr. George SCHATZ (MO) has collected a unicate specimen (*Schatz 1842*) in North East Madagascar that seems to have a leaf pattern similar to that of *M. acuminata* but lacks a decurrent leaf base. However, with only one sheet available, it is difficult to assign SCHATZ's collection to *M. acuminata* with certainty, and more material will be needed to establish its taxonomic status.

HABITAT, DISTRIBUTION AND PHENOLOGY. — *Micronychia acuminata* has so far been collected only in the Betampona reserve, an area with humid eastern forest on laterite, between 250-500 m elevation (Fig. 2). The fruiting period is in August and September, and flowering probably occurs in April and May.

VERNACULAR NAMES. — Tsiramiramy, Hazondomohina.

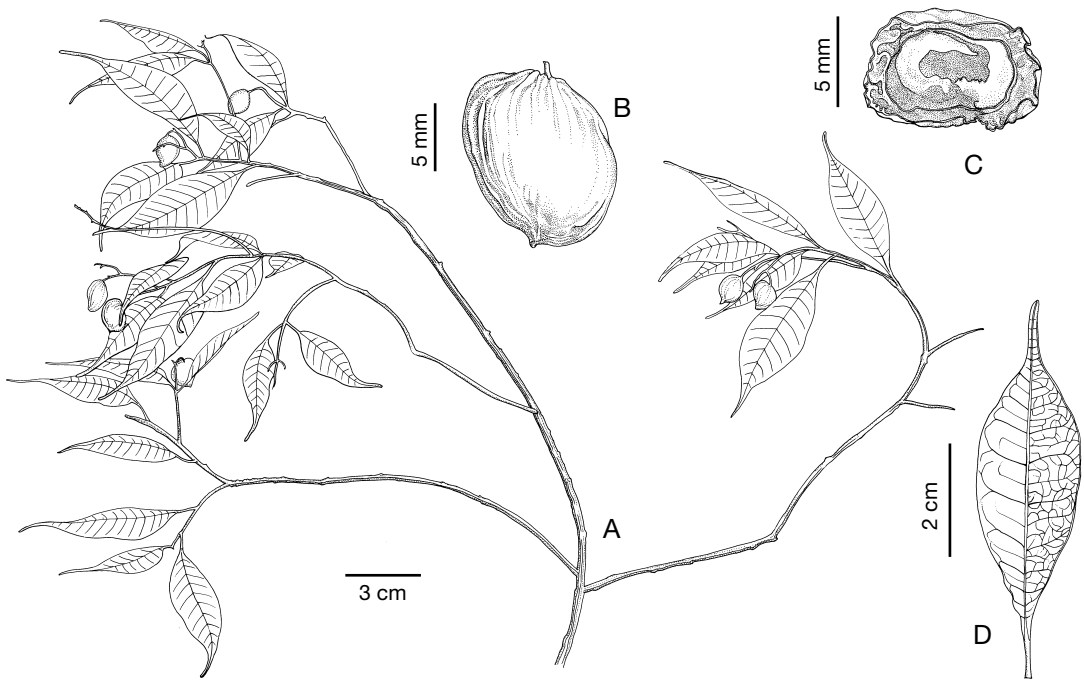

Fig. 1. — ***Micronychia acuminata:*** **A**, branch with leaves and fruits; **B,** shape of mature fruit; **C,** cross section of fruit; **D,** leaf with nervation.

PARATYPES. — MADAGASCAR: *RN 2649 (Georges Rakotonirina)*, Toamasina Prov., Ambodiriana, RNI n° 1 Betampona, 26 Aug. 1950, fr. (P!); *RN 4398,* 7 Sep. 1952, fr. (P !); *RN 5361,* 28 Aug. 1958, fr. (P!); *RN 9743 (Razanaparany)*, Ambodiriana, RNI n° 1 Betampona, 24 June 1953, fr. (P!).

Micronychia danguyana H. Perrier

Mém. Mus. Hist. Nat. Paris 18: 267 (1944). — Lectotype (here designated): *Decary 5034,* Madagascar, Fianarantsoa Prov., Farafangana, Befotaka, 20 Aug. 1926, fl. (P!).

Trees, ca. 6-9 m tall; young twigs ferrugineous pubescent, bark with translucide latex. Leaves coriaceous, persistent; blades obovate to elliptic, 8.5-22 cm long, 4.5-11 cm wide, apex rounded, base cuneate, margin entire; adaxial surface ferrugineous pubescent when young, glabrescent and pubescent only on the veins and margin when older, abaxial surface pubescent and ferrugineous; venation pinnate and cladodromous, midvein prominent below, 20-22 pairs of secondary veins, 2-15 mm apart, arcuate, prominent below, forming an obtuse angle with the midrib at the leaf base. Petiole 20-25 mm long, shallowly channeled, tomentose. Inflorescence terminal paniculate, 13-18 cm long, branches regular, villous; bracts triangular, 1.5-2 mm long, 0.5-1 mm wide, pubescent outside. Flowers 5-merous, unisexual; pedicel 0.5 mm long, pubescent; calyx lobes ovate to deltate, 1.5 mm long, 1.5 mm wide, sericeous outside, imbricate; corolla lobes obovate, 5 mm long, 2 mm wide, pubescent outside, red or pink, imbricate; stamens 5; in staminate flowers filaments 5.5 mm long, sigmoid, inserted basally on the outer surface of the disk, glabrous; anthers ca. 1 mm long, ovate, yellow, glabrous, dorsifixed, introrse, dehiscent by longitudinal slits; disk dish-shaped and crenulate, glabrous, ovary rudimentary. Pistillate flowers and fruit unknown.

HABITAT, DISTRIBUTION AND PHENOLOGY. — *Micronychia danguyana* occurs in the rainforest of southeastern Madagascar (Fig. 2). It has been collected in flower and young fruit in late August.

VERNACULAR NAME. — Karakatafy.

This species is sometimes confused with *M. macrophylla*, but its leaves are more obovate, much smaller in size, and lack a decurrent base, making its petiole length much greater than that of *M. macrophylla* (20-25 mm vs. 7-15 mm).

PERRIER DE LA BÂTHIE (1944) cited two collections when he first published *M. danguyana*, which constitute syntypes. One of them (*Decary 5034*) has been selected as the lectotype because it has flowers.

ADDITIONAL MATERIAL EXAMINED. — MADAGASCAR: *Decary 4767*, Fianarantsoa Prov., Farafangana, Befotaka, 13 Aug. 1926, fr. (P!).

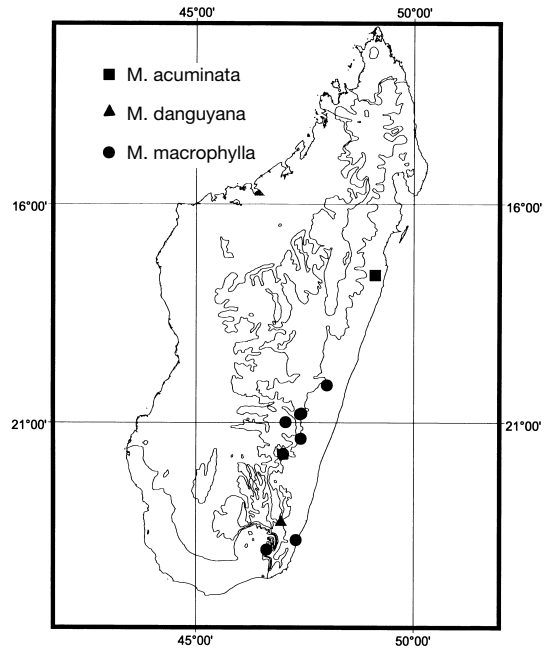

Fig. 2. — Geographic distribution of ***Micronychia acuminata***, ***M. danguyana***, and ***M. macrophylla***.

Micronychia macrophylla H. Perrier

Mém. Mus. Hist. Nat. Paris 18: 266 (1944). — Lectotype (here designated): *Perrier de la Bâthie 12605,* Madagascar, Fianarantsoa Prov., forêt orientale, bassin de Manampatra, 400 m, May 1929, fl. (P! [mounted on 2 sheets]).

Trees, ca. 5 m tall; young twigs pubescent and with lenticels, bark with white milky or translucid latex. Leaves alternate and clustered at the end of branches, simple, subcoriaceous to chartaceous, persistent; blades oblanceolate, 17.5-53 cm long, 4.5-13 cm wide, apex shortly acuminate, base cuneate decurrent, margin entire; adaxial surface glabrous, pubescent or puberulous, abaxial surface pubescent or glabrous except the veins. Venation pinnate and cladodromous, midvein prominent below, 20-30 pairs of secondary veins, 1.5-15 mm apart, arcuate, prominent below, forming an obtuse angle with the midrib at the leaf base. Petiole 7-15 mm long, shallowly channeled, glabrescent or pubescent. Inflorescence terminal, pendent, paniculate, 10-40 cm long, pubescent; bracts triangular to deltate, ca. 1.5-2 mm long, 1-1.5 mm wide, pubescent on abaxial surface. Flowers 5-merous, unisexual; calyx lobes ovate to deltate, 1-2.5 mm long, 1-2 mm wide, pubescent outside, imbricate, caducous; corolla lobes narrowly elliptic, narrowly oblong or narrowly ovate, 7-9 mm long, 2.5-4 mm wide, pubescent abaxially but only on the longitudinal main axis, red to pink, imbricate; stamens 5; in staminate flowers filaments 8-9 mm long, sigmoid, inserted basally on the outer surface of the disk, glabrous, white; anthers 2-2.5 mm long, ovate, yellow, glabrous, dorsifixed, introrse, dehiscent by longitudinal slits; disk dish-shaped and crenulate, 1.5-2 mm in diameter, glabrous, ovary redumentary; in pistillate flowers filaments 1.5-2 mm long, straight, flattened, and broadened at the base, glabrous, yellow, inserted basally on the outer surface of the disk; anthers 0.5-0.6 mm long, subglobose, yellow, glabrous; disk annular, cup-shaped, crenulate, glabrous; ovary transversally oblong, laterally compressed, and asymmetrically oblique, 1.5-2 mm long, 1-1.5 mm broad, glabrous, unilocular, ovule one, anatropous and with a long funicle, placentation parietal; the single style trifid

and curved, lateral, 7-8 mm long, pubescent; stigma capitate and trilobed. Fruits 17 cm long, 11 cm broad (with 0.8 mm lateral width), mango-shaped and asymmetrical, glabrous with longitudinal striations, mesocarp resinous, endocarp.

HABITAT, DISTRIBUTION AND PHENOLOGY. — *Micronychia macrophylla* is a midstory species occurring from southeast lowland rainforest (100 m) to the eastern part of central plateau at 1000 m elevation (Fig. 2). It has been collected with flowers in June and July, and with fruits in October and November.

VERNACULAR NAMES. — Sefana, Betamba.

This species has the largest leaf size in the genus, 17.5-53 cm long and 1.5-13 cm wide; it also has a relatively shallowly channeled and short petiole, and a very large inflorescence, from 10 to 40 cm long.

ADDITIONAL MATERIAL EXAMINED. — MADAGASCAR: *Lewis et al. 80,* Fianarantsoa Prov., Ambalavao, Andringitra, Camp I, ca. 45 km S of Ambalavao, E bank of Iantara river, along Ambalamanenjana-Ambatomboay trail, edge of Andringitra Reserve, 22°13'20''S, 47°01'29'E, 720 m, 15-21 Nov. 1993, fr. (MO, P, TAN); *Daniels 73,* Fianarantsoa Prov., 7 km W of Ranomafana, just S of Namorona River, Duke University Primate Center study site, 21°16'S, 47°25'E, 1000 m, 27 Sep. 1987, fr. (MO, P, TAN); *Decary 5719*, Farafangana: massif de l'Ikongo, 17 Oct. 1926, fr. (P); *Decary 14191,* Nosy-Varika, vallée de Sakaleona (forêt orientale), 11 June 1939, fl. (P); *Guillaumet 3856*, Toliara, Fort-Dauphin: bord de rivière, lieu dit Bekazaha, rebord orientale des chaînes anosyennes à l'ouest de Manantenina, 100 m, 10 July 1971, yg. fr. (P); *Kotozafy 35*, Parc national Ranomafana, parcelle n° 3, Talatakely, 21°15'S, 47°27'E, 800-1000 m, 15-30 June 1993, fl. (MO, P, TAN); *Kremen et al. 18,* Ifanadiana: 7 km SW of town of Ranomafana, in proposed Ranomafana National park, rainforest, 21°16'S, 47°25'E, 1000-1100 m, 5 Feb. 1990 (MO); *Lowry 4360,* Ranomafana along R.N.45 between Fianarantsoa and Ifanadiana, along escarpement of central plateau, somewhat disturbed wet forest along trail toward the Primatologists camp ca. 5 km above the village, 1150 m, 17 Aug. 1987, fr. (MO, P, TAN); *Lowry 4525A, 4525*, Ranomafana National Park, ca. 7 km W of town of Ranomafana, on hillside behind Duke/DEF field building, wet primary forest on slope, 21°16'S, 47°25'E, 950-1000 m, 17 May 1990, fl. (MO, P, TAN); *Malcomber et al. 1012*, R.N. 45, Parc National Ranomafana, between Fianarantsoa and Ifanadiana, disturbed forest area around cabine de recherche, S of Namorona river, 21°15'S, 47°27'E, ca. 900 m, 14 Nov. 1991, fr. (MO, P, TAN); *Malcomber et al. 1526*, NW of Tolagnaro, RNI n° 11 Andohahela, parcelle 1, forest bordering Andohahela river, canopy ca. 25 m., 27°36'S, 49°34'E, 200-500 m, 14-19 May 1992, fl. (MO, P, TAN); *Randrianasolo et al. 494*, Parc Ranomafana, roadside of R.N. 45.2 km before the Gite d'étape, 21°16'S, 47°25'E, ca. 1000 m, 7 Oct. 1996, fr. (MO, P, TAN); *Schatz & Seigler 1403*, Eastern Domain, 7 km W of Ranomafana, S of Namorona River, Duke University Primate Center study site, wet escarpement forest, 21°16'S, 47°25'E, 1000 m, 17 May 1987, fl. (MO, P, TAN); *SF 2137, 2156*, Fianarantsoa, fl. (P); *SF 14426*, Fort Carnot, Andrambovato, 10 May 1954, fl. (P); *SF 14462*, Fort Carnot, Amdrambovato, 12 June 1954, fl. (P); *SF 15399*, Fort Carnot: Andrambovato, 23 Aug. 1955, fr. (P); *SF 26054,* Elolo, RNI n° 11 Andohahela, 28 May 1966, fl. (P); *SF 26436*, Elolo, RNI n° 11 Andohahela, 3 July 1967, fl. (P).

Micronychia madagascariensis Oliv.

Hook. Icon. Pl., ser. 3, 14: 27 (1881). — Type: *Langley Kitching s.n.*, Madagascar, Tanala (holo-, P!).

Trees or vines, 3 m tall; young twigs ferrugineous pubescent and with lenticels, bark with translucid latex. Leaves coriaceous or subcoriaceous, persistent; blades obovate to elliptic, 4-9 cm long, 2-4.5 cm wide, apex emarginate, rounded or shortly acuminate, base acute or cuneate, rarely obtuse, margin entire; adaxial surface glabrous, abaxial surface pubescent. Venation pinnate and mixed craspedodromous, midvein prominent below, 8-13 pairs of secondary veins, 2-10 mm apart, arcuate, prominent below, forming an obtuse angle with the midrib at the leaf base, tertiary veins somehow reticulate. Petiole 10-13 mm long, pubescent, shallowly channeled at the leaf junction but more flattened toward the stem. Inflorescence a terminal, pendent panicle, 4-15 cm long, branches regular, villous; bracts triangular, 1-6 mm long, 0.5-1 mm wide, abaxial surface woolly. Flowers 5-merous, unisexual; pedicel ca. 0.2 mm long, woolly; calyx lobes triangular, ovate or deltate, 1.5-2 mm long, 1-1.5 mm wide, abaxially hirsute, imbricate, caducous; corolla lobes ovate to oblong or narrowly oblong to

narrowly ovate, 6-7.5 mm long, 1.8-3mm wide, pubescent abaxially on the longitudinal main axis, red, imbricate or quincuncial; stamens 5; in staminate flowers filaments 4.5-7 mm long, sigmoid, inserted basally on the outer surface of the disk, glabrous, white; anthers 1.5-2 mm long, ovate to subglobose, yellow, glabrous, dorsifixed, introrse, dehiscent by longitudinal slits; disk dish-shaped, ca. 1.5 mm in diameter, glabrous, ovary rudimentary; in pistillate flowers filaments 0.5-2 mm long, straight, flattened, broadened at the base, glabrous, white, inserted basally on the outer surface of the disk; anthers ca. 0.5 mm long, subglobose, yellow, glabrous; disk annular, 1-1.5 mm long in diameter, glabrous; ovary asymmetrically oblique, 1-3 mm long, 1-1.5 mm broad, glabrous, unilocular, ovule one, anatropous with a long funicle, placentation parietal; the single style trifid, curved and lateral, 3.5-5.5 mm long, glabrous; stigmas 3, capitate. Fruits drupaceous, 0.8-0.9 cm long, ca. 1 cm broad, widely depressed ovate, surface with longitudinal striations, glabrous, mesocarp resinous, one seeded, pyrene with two very well separated cotyledons.

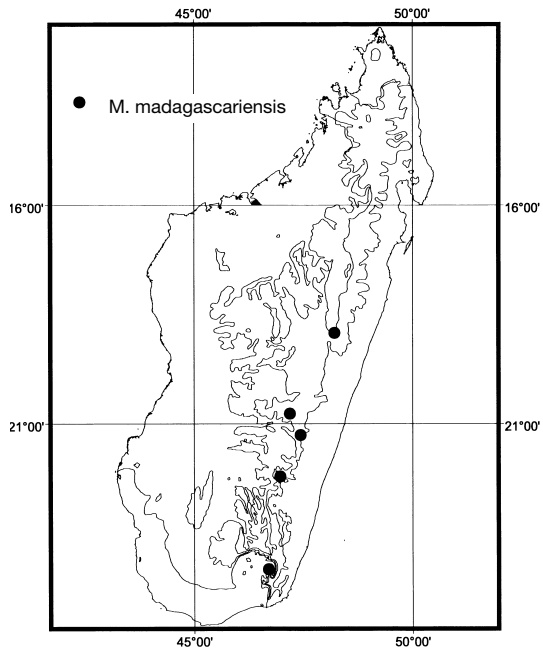

Fig. 3. — Geographic distribution of ***Micronychia madagascariensis***.

HABITAT, DISTRIBUTION AND PHENOLOGY. — *Micronychia madagascariensis* occurs in montane or premontane rainforest in the eastern part of Central domain (HUMBERT 1955) between 1000-1500 m (Fig. 3). It has been collected in flower in February and July and in fruit in December.

VERNACULAR NAME. — Hazomafana.

Micronychia madagascariensis is markedly distinguished by the very long hairs on its inflorescence and leaf blades, and its small sized leaves (4-9 cm long and 2-4.5 cm wide) with a base that is not decurrent.

ADDITIONAL MATERIAL EXAMINED. — MADAGASCAR: *Lewis et al. 961,* Fianarantsoa Prov, Ambalavao, Andringitra, Camp III, ca. 40 km S of Ambalavao, Andringitra Reserve, along tributary of Sahavatoy river, 22°13'22'S, 46°58'18'E, 1210 m, 1-7 Dec. 1993, fr. (MO, P, TAN); *Catat 4339*, Toliara Prov., vallée d'Ambolo, 1 July 1890, fl. (P); *Edelman 133,* Fianaranstsoa Prov., Ranomafana, 25 July. 1987, fl. (MO, P, TAN); *Humbert 4857*, Fianarantsoa Prov., Ambositra, forêt de Ranomena, 1300-1400 m, 25 July 1928, fl. (P); *Raphaël Rakoto 110*, Fianarantsoa Prov., Ifanadiana, Ranomafana National Park, Parcelle 3, Vatoharanana, 21°16'S, 47°26'E, 900-1100 m, July 1992, fl. (MO, P, TAN); *SF 6125,* Toamasina Prov., Moramanga, Ambatoafo, 4 July 1952, fl. (P); *SF 17406 (Jaonarivelo),* Toliara Prov., Amboasary: Tsivory, Esira, 19 Feb. 1956, fl. (P).

Micronychia tsiramiramy H. Perrier

Mém. Mus. Hist. Nat. Paris 18: 267 (1944). — Lectotype (here designated): *Gouvernement Général de Madagascar 56,* Madagascar, Toamasina Prov., forêt d'Analamazaotra, fl. (P!; iso-, P!).

Trees or shrubs, 2-20 m tall; young twigs glabrous, sometimes with lenticels and fine pubescence at the tip, bark with translucide latex. Leaves coriaceous or subcoriaceous, persistent; blades oblanceolate to obovate, narrowly elliptic or elliptic, 2-11.5 cm long, 1-5.3 cm wide, apex emarginate, retuse, rounded or shortly acuminate, base acute to cuneate decurrent, margin entire; adaxial and abaxial surfaces glabrous. Venation pinnate and craspedodromous, midvein

prominent below, 9-11 secondary veins, 3-8 mm apart, arcuate or more or less parallel, prominent below, forming an obtuse angle with the midrib at the leaf base, tertiary veins ramified, admedial, some veins connected with others' branches. Petiole 3-15 mm long, canaliculate or shallowly channeled, glabrous to glabrescent. Inflorescence axillary, subterminal or terminal, pendent, paniculate, with zigzag rachis, 1.5-9 cm long, branches flattened, sometimes regular, glabrous or glabrescent; bracts triangular or deltate, 0.5-2 mm long, 0.5-1 mm wide, abaxially setulose. Flowers 5-merous, unisexual; pedicel 0.2-1.5 mm long, glabrous or pubescent; calyx lobes very widely or widely depressed ovate, 1-2.5 mm long, 1-2.5 mm wide, abaxially glabrous, imbricate; corolla lobes ovate to oblong or obovate, 3-5 mm long, 1.5-3 mm wide, abaxially glabrous, pink, imbricate or quincuncial; stamens 5; in staminate flowers filaments 1.5-2 mm long, straight, flattened and broadened at the base, inserted basally on the outer surface of the disk, glabrous, white; anthers 1-2 mm long, oblong to slightly ovate and curved, yellow, glabrous, dorsifixed, introrse, dehiscent by longitudinal slits; disk shallowly cup-shaped or cupiliform, 1-1.5 mm in diam., glabrous, ovary rudimentary; in pistillate flowers filaments 1-1.5 mm long, straight, flattened and broadened at the base, glabrous, white, inserted basally on the outer surface of the disk; anthers 0.5-1 mm long, ovate, yellow, glabrous; disk annular and cup-shaped, ca. 1.5 mm in diam., glabrous; ovary widely depressed to depressed ovate or very widely ovate, laterally compressed and asymmetrically oblique, 1-2 mm long, 1 mm broad, glabrous, unilocular, with 1 anatropous ovule with a long funicle, placentation parietal; the single style trifid, lateral or latero-subapical, 1-1.5 mm long, glabrous; stigmas 3 lobed and capitate. Fruits drupaceous, 0.8-1.4 cm long, 0.6-1.5 cm broad, asymmetric and mango-shaped, surface with longitudinal striations, glabrous, mesocarp resinous, endocarp thin.

Micronychia tsiramiramy is distinguished from the other species of *Micronychia* by having leaves that are glabrous on both surfaces with a decurrent base and a retuse, emarginate, rounded or shortly acuminate apex.

Two varieties were described by PERRIER DE LA BÂTHIE (1944), both of which are recognized here. They are easily distinguishable by leaf and floral characters, but the differences are not sufficient to justify recognizing them as separate species.

Key to the varieties of *Micronychia tsiramiramy*

1. Leaves 3-11.5 cm long, 1.8-5.3 cm wide; petiole 3-15 mm long; sepals 1.5-2.5 mm long, 1.8-2.5 mm wide ..... var. **tsiramiramy**
1.' Leaves 2-6.5 cm long, 1-3 cm wide; petiole 3-6 mm long; sepals 1 mm long,1 mm wide .... var. **minutiflora**

— var**. tsiramiramy**

Trees 8-20 m tall. Leaves 3-11.5 cm long, 1.8-5.3 cm wide, secondary veins arcuate; petiole 3-15 mm long, canaliculate. Inflorescences axillary, subterminal or terminal, 1.5-9 cm long; bracts 1-2 mm long, 1 mm wide, abaxially setulose. Flowers with pedicel 0-0.2 mm long, pubescent; calyx lobes widely depressed ovate, 1.5-2.5 mm long, 1.8-2mm wide, caducous; corolla lobes ovate or obovate, 3-5 mm long, 2-3 mm wide; staminate flowers with filaments 1.5-2 mm long; anthers 1-2 mm long; disk shallowly cup-shaped, 1-1.5 mm in diam.; pistillate flowers with filaments 1.2-1.5 mm long; anthers 1 mm long; disk annular and cup-shaped, ca. 1.5 mm long in diam.; 1-2 mm long, 1 mm broad; the single style trifid, lateral, 1-1.5 mm long. Fruits 1.2-1.4 cm long, ca. 1.5 cm broad, widely depressed ovate.

HABITAT, DISTRIBUTION AND PHENOLOGY. — *Micronychia tsiramiramy* var. *tsiramiramy* occurs from eastern coastal forests to premontane wet forests along the Eastern escarpment, at an alti-

tude of about 900 m (Fig. 4). It has been collected in flower in June-October and in fruit in December-January.

VERNACULAR NAMES. — Tsiramiramy, ditimena, ditimenalahy, ditimena tsiramiramy.

ADDITIONAL MATERIAL EXAMINED. — MADAGASCAR: *Louvel 49,* Toamasina Prov., forêt d'Analamazaotra, 18°56'S, 48°26'E, fl. (P); *Louvel 178*, forêts montagneuses de l'Est, fl. (P); *Perrier de la Bâthie 5274*, Toamasina Prov., forêt d'Analamazaotra, 900 m, forêt des cimes, fr. (P); *Perrier de la Bâthie 6400*, Toamasina Prov., forêt d'Analamazaotra, 800 m, futaie des cimes, fr. (P); *Randrianasolo 408*, Toamasina Prov., station forestière d'Analamazaotra, 18°57'20'S, 48°24'30'E, 950 m, 16 July 1996, (MO, P, TAN); *SF n° 0 (Capuron)*, without precise locality, fl. (P); *SF 2625*, Toamasina Prov., Menalamba Périnet, 18°52'S, 48°22'30'E, 25 June 1950, fl. (P); *SF 7590*, Bekiritsika Lakato, 19°11'30'S, 48°26'E, 8 oct. 1953, fl. (P); *SF 8797 (Capuron)*, Toamasina Prov., Maroantsetra: forêt orientale, crête au NW du col d'Ambatondradama (entre les bassins de la Sahafihitra et de la Mahalevona), vers 700 m, 25 Nov. 1953, fr. (P); *SF 14972*, Toamasina Prov., Moramanga: Antaniditra Perinet, 18°51'25'S, 48°22'40'E, 900 m, 6 July 1955, fl. (P); *SF 18041 (Capuron),* Toamasina Prov., forêt d'Analamazaotra, Périnet, 18°56'S, 48°26'E, 29 July 1957, fl., fr. (P-2 sheets); *SF 18050 (Capuron)*, Toamasina Prov., centre est: forêt d'Analamazaotra Périnet, 18°56'S, 48°26'E, 29-30 July 1957, fl. (P); *SF 18725 (Capuron)*, Toamasina Prov., Ambatondrazaka: Centre Est : vallée de la Voromahery, à l'Est de Nosivolo, canton de Manakambahiny-Est, limite ouest de la RNI n° 3 Zahamena, 27 Aug. 1958, fl. (P-2 sheets); *SF 26603*, Toamasina Prov., Toby, PK 27, route d'Anosibe, 12 Sep. 1967, fl. (MO, P); *SF 26929*, Toamasina Prov., Nangaranana Marovoay, Feb. 1970 (P).

— var. **minutiflora** H. Perrier

Mém. Mus. Hist. Nat. Paris 18: 268 (1944). — Type: *Perrier de la Bâthie 4540,* Madagascar, Mahajanga Prov., bassin supérieur de Bemarivo, affluent de la Sofia, forêt d'Analamaitso, bois des pentes occidentales, vers 1000 m d'altitude, sur gneiss, Sep. 1907, fl. (holo-, P!).

Trees or shrubs ca. 2-20 m tall. Leaves 2-6.2 cm long, 1-3 cm wide, with secondary veins more or less parallel; petiole 3-6 mm long, shallowly channeled, slightly pubescent when young, glabrous when older. Inflorescence terminal, 1.5-4 cm long, pubescent when young, glabrescent when older; bracts 0.5-1 mm long, 0.5 mm wide. Flowers with pedicel 0.5-1.2 mm long, glabrous; calyx lobes 1 mm long, 1 mm wide, very widely ovate; corolla lobes 4-5 mm long, 1.5-2 mm wide; staminate flowers with filaments 2 mm long, anthers 1.5-1.8 mm long; disk cupuliform and crenulate, ca. 1 mm in diam.; pistillate flowers with filaments ca. 1 mm long, anthers 0.5-1 mm long, ovate to subglobose; disk annular and shallowly cup-shaped, 1.5 mm long in diam.; ovary 2 mm long, 1.5 mm broad, funicle more or less long; the single style trifid, slightly curved, latero-subapical, 1.5 mm long. Fruit 0.8-1.2 cm long, 0.6-1.1 cm broad.

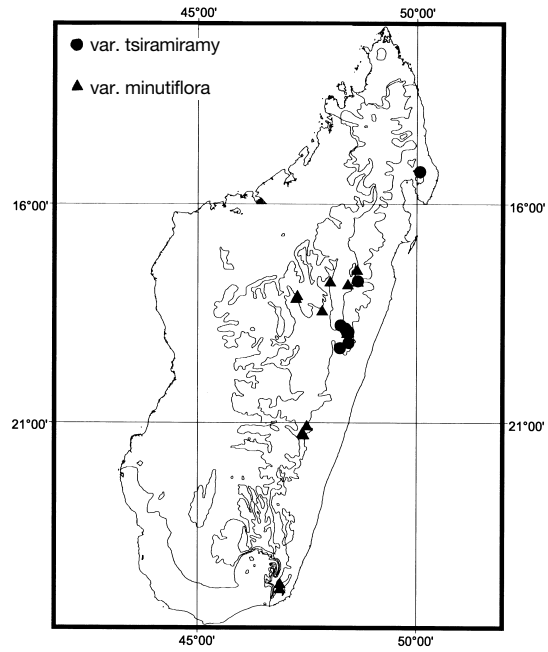

Fig. 4. — Geographic distribution of ***Micronychia tsiramiramy*** var. ***tsiramiramy*** and var. ***minutiflora***.

HABITAT, DISTRIBUTION AND PHENOLOGY. — *Micronychia tsiramiramy* var. *minutiflora* is distributed in the eastern region (HUMBERT 1995), generally in rainforest at low altitude (ca. 100 m) to premontane or montane humid forest up to 1,500 m (Fig. 4). It flowers from May to August and fruits in September-October. However, these periods can fluctuate from one year to another.

VERNACULAR NAMES. — Ditimena, Sandramy mena.

Micronychia tsiramiramy var. *minutiflora* differs from the typical variety by its small leaf size (2-6.5 cm long, 1-3 cm wide vs. 3-11.5 cm long, 1.8-5.3 cm wide), its short petiole (3-6 mm vs. 3-15 mm long) and its widely ovate and small sepals (1 mm long, 1 mm wide vs. 1.5-2.5 mm long, 1.8-2.5 mm wide).

ADDITIONAL MATERIAL EXAMINED. — MADAGASCAR: *Exposition coloniale de Marseille S.N.*, without precise locality, fr. (P); *Lewis 561,* Antananarivo Prov., high plateau, 16 km NNE of Anjozorobe, montane forest on southern slopes of Mt. Tsimanahirivotra, 1350 m, 24 Aug. 1993, fl. (P); *Floret 1952*, Toliara Prov., Fort-Dauphin: RNI n° 11 Andohahela, 22 km N d'Ifarantosoa, forêt dense humide secondarisée, bords de la piste Ranomanala Sud, 24°47'S, 46°52'E, 120 m, 28 Apr. 1958, fl. (MO, P, TAN); *Kotozafy et al. 187,* Fianarantsoa Prov., Parc National Ranomafana, parcelle n° 1, à l'est du village Vohiparara, 21°14'S, 47°23'E, 24-25 Aug. 1993, fl. (MO, P, TAN); *Kotozafy et al. 247*, Fianarantsoa Prov., Parc National Ranomafana, parcelle n° 2, Maranony, au Sud d'Ambohimiera, 21°04'S, 47°29'E, 880-1100 m, 18-20 Sep. 1993, fl. (MO, P, TAN); *Louvel 89*, Toamasina Prov., Moramanga: Analamazaotra, Aug. 1924, fl. (P); *Malcomber 1068*, Fianarantsoa prov., Ifanadiana: between Fianarantsoa and Ifanadiana, route nationale 45, Parc National Ranomafana, trail S from Cabine de recherche to Vato camp used by primatologist, primary tropical forest canopy, 20-30 m, 21°15'S, 47°27'E, 1100 m, 11-15 Nov. 1991, fr. (MO, P, TAN); *Malcomber et al. 1596*, Fianarantsoa prov., Ranomafana National Parc, parcelle I, near village of Miaramony, Anosimasina, 21°09'S, 47°32'E, 600-900 m, 19-21 Sep. 1992, fl. (MO, P, TAN); *Perrier de la Bâthie 14888*, Toamasina Prov., forêt d'Analamazaotra, Oct. 1922, fl. (P); *Rakotozafy et al. 2669*, Antananarivo Prov., Anjozorobe: forest near Anjozorobe, 18°26'30'S, 47°50'30'E, 1400 m, 31 Aug. 1991, fl. (MO-2 sheets, P, TAN); *Rakotozafy et al. 2686*, Antananarivo Prov., forest near Anjozorobe, forest margin, 18°26'30'S, 47°50'30'E, 1400 m, 1 Sep. 1991, fl. (MO-2 sheets, P, TAN); *Rakotozafy et al. 2718, 2726*, Antananarivo Prov., forest near Anjozorobe, southern boundary, 18°26'30'S, 47°50'30'E, 1400 m, 2 Sep. 1991, fl. (MO-2 sheets, P, TAN); *Rakotozafy et al. 2739*, Antananarivo Prov., forest near Anjozorobe, 18°26'30'S, 47°50'30'E, 1400 m, 3 Sep. 1991, fr. (MO-2 sheets, P, TAN); *Randriamampionona 484*, Toliara Prov., RNI n° 11, Andohahela, Parcelle 1, Isaka Ivondro, 24°40'S, 46°52'E, 100-500 m, 12-23 June 1993, fr. (P); *Randriambololona et al. 10*, Toamasina Prov., Parc National de Mantady, à 14 km des mines des Graphites, sur le côté du sentier, forêt humide, 18°56'S, 48°26'E, 960 m, 27 Oct. 1993, fr. (MO, P, TAN); *Randrianasolo 502*, Fianarantsoa Prov., Parc Ranomafana, 4 km N of Vohiparara, E of Bridge, along the trail going to parcelle n° 3, 9 Oct. 1996, fr. (MO, P, TAN); *Rakoto 233*, Fianarantsoa Prov., Est de Fianaranatsoa, Parc National de Ranomafana, parcelle n° 3, Talatakely, 21°16'S, 47°25'E, 800-1000 m, 3 Sep. 1992, fl. (MO, P, TAN); *RN 7824 (Botoalina)*, Nonokambo, 15 Aug. 1955, fl. (P); *SF 1697*, Toamasina Prov., Ambatondrazaka, fl. (P); *SF 5814*, Sahamaloto-Périnet, 12 Sep. 1952, fl. (P); *SF 15149*, Antananarivo Prov., Vohitrilongo, Manakasina, canton Betatao, 26 Aug. 1955, fl. (P); *SF 16008 (Capuron)*, Antananarivo Prov., Ankazobe: jardin Botanique n° 3, Ambohitantely, Manankazo, Canton Maharidaza, 22 June 1955, fl. (P); *SF 16821 (Capuron)*, Antananarivo Prov., Manankazo, jardin botanique n° B1, 26 June 1955, fl. (P); *SF 18005-18020 (Capuron)*, Antananarivo Prov., forêt d'Ambohitantely, sur le Tamponketsa d'Ankazobe, au Nord de Tananarive, 1600 m, July 1957, fl. (P); *SF 18736 (Capuron),* Toamasina Prov., vallée de la Voromahery, à l'Est de Nosivolo, Canton Manakambahiny-Est, limite Ouest de la RNI n° 3 Zahamena, 27 Aug. 1958, fl. (P-2 sheets); *SF 18742 (Capuron)*, Toamasina Prov., restes de forêt, dans la vallée de la Saharahara, entre Manakambahiny-Est et Nonokambo, Ouest de la RNI n° 3 Zahamena, 28 Aug. 1958, fl. (P); *SF 18756 (Capuron),* Toamasina Prov., Ambatondrazaka: forêt d'Andranovakoana, à l'Ouest de Manohilahy (Canton d'Amparafaravola, 1100-1300 m, 30 Aug. 1958, fl. (P).

Excluded name

Micronychia humberti H. Perrier, in Flore de Madagascar et des Comores, 114e famille (Anacardiacées): 70 (1946). — Type: *Humbert 3393*, Madagascar, Fianarantsoa Prov., forêt à l'Est d'Ivohibe (Bara) (holo, P!). This species is only known from the type collection, and according to observations of its fruits and leaves, it is correctly named as *Rhus taratana* (Baker) H. Perrier. Four specimens (*Rabevohitra 2430, RN 7464, Schatz et al. 1892*, and *SF 7659*) exhibit characters that are different from one another and from other material of *Micronychia.* However, a decision on their identity will have to be postponed until additional material can be collected and studied.

Acknowledgements

I am grateful to Pete LOWRY for his input and valuable comments on the manuscript. I am also thankful

to Jim MILLER, George SCHATZ and Mick RICHARDSON for their assistance in many different ways during the study. Special thanks also go to Barbara ALONGI for making the illustration. I am grateful to several herbaria and their staffs (MO, P, NY, TAN, TEF) for making specimens available for this study, both by loan and during visits. Finally, I thank the Liz Claiborne and Art Ortenberg Foundation for providing financial support during my Ph.D. study, and the Garden Club of Allegheny County in Pittsburgh, Pennsylvania and the African Dissertation Internship Program Department of the Rockfeller Foundation for supporting field work in Madagascar.

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Manuscript received 8 September 1998;
revised version accepted 28 September 1999.