

Four new species and one new combination in the Malagasy endemic genus *Micronychia* Oliv. (Anacardiaceae)

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Randrianasolo A. & Lowry II P. P. 2009. — Four new species and one new combination in the Malagasy endemic genus *Micronychia* Oliv. (Anacardiaceae). *Adansonia*, sér. 3, 31 (1): 157-168.

ABSTRACT

Four new species of the Malagasy endemic genus *Micronychia* are described based on newly available material, and a previously recognized variety is elevated to the rank of species, bringing the total number of accepted species to 10, a two-fold increase. Illustrations are provided for each of the new taxa, along with preliminary assessments of their conservation status. An identification key in English and French is also included.

RÉSUMÉ

Quatre nouvelles espèces et une nouvelle combinaison dans le genre endémique malgache Micronychia Oliv. (Anacardiaceae).

Quatre nouvelles espèces de *Micronychia*, genre endémique de Madagascar, sont décrites d'après du matériel récemment récolté. Une variété déjà reconnue est également élevée au rang d'espèce, portant à 10 le nombre d'espèces acceptées, soit un doublement de leur total. Des illustrations sont fournies pour chaque nouveau taxon ainsi qu'une première estimation de leur statut de conservation. Une clé d'identification en anglais et en français est aussi incluse.

KEY WORDS

Anacardiaceae,
Micronychia,
Madagascar,
conservation,
new species.

MOTS CLÉS

Anacardiaceae,
Micronychia,
Madagascar,
conservation,
espèces nouvelles.

INTRODUCTION

In a recent revision of the endemic Malagasy genus *Micronychia* Oliv. (Anacardiaceae), Randrianasolo (2000) recognized a total of five species, two of which were described as new. Since then, many new collections have become available through the efforts of locally based field botanists and visiting researchers, including some that can not be referred to any of the currently-recognized species of *Micronychia*. As part of our ongoing studies of Anacardiaceae, we have examined this new material and determined that it contains collections representing four new, well-delimited species, which we describe here. In the process of evaluating these novelties, we have also reviewed the circumscriptions adopted by Randrianasolo (2000), which has led us to elevate one of the varieties he recognized to the rank of

species. These additions bring the total number of species of *Micronychia* to 10, doubling its size. As a consequence of this increase, the key included in Randrianasolo's revision is now of limited use, so we provide a new key to facilitate identification of all of the currently recognized taxa. The new species described here do not, however, necessitate altering or expanding the generic description provided by Randrianasolo (2000). A complete listing of exsiccatae for each member of the genus, including full locality information, dates, and latitude/longitude coordinates, is available through TROPICOS (<http://www.tropicos.org/>). Geographic coordinates given in square brackets for material cited below were assigned post fact using the gazetteer of botanical collecting localities in Madagascar, which can be found at <http://www.mobot.org/MOBOT/research/madagascar/gazetteer/>.

KEY TO THE SPECIES OF *MICRONYCHIA* OLIV.

1. Leaves entirely glabrous on both surfaces 2
- Leaves with at least a few trichomes on one surface 6
2. Leaf apex rounded, emarginate or retuse 3
- Leaf apex acute to long acuminate 4
3. Leaf blade 3-11.5 cm long; petiole 3-15 mm long; sepals 1.5-2.5 × 1.8-2.5 mm *M. tsiramiramy*
- Leaf blade 2-6.5 cm long; petiole 2-6 mm long; sepals 1 × 1 mm *M. minutiflora*
4. Largest leaf blade less than 8 cm long; distance between secondary veins in median portion of leaf blade less than 1 cm *M. acuminata*
- Largest leaf blade at least 8 cm long; distance between secondary veins in median portion of leaf blade at least 1 cm 5
5. Leaves opposite; petiole less than 10 mm long; infructescence 2.5-5 cm long; fruit surface markedly striate *M. striata*
- Leaves alternate; petiole at least (8-)10 mm long; infructescence c. 10 cm long; fruit surface with obscure striations *M. benono*
6. Leaf blade obovate to elliptic 7
- Leaf blade oblanceolate 8
7. Leaf blade 4-9 × 2-4.5 cm, with 8-13 pairs of mixed craspedodromous secondary veins *M. madagascariensis*
- Leaf blade 8.5-22 × 4.5-11 cm, with 20-25 pairs of cladodromous secondary veins *M. danguyana*
8. Base of leaf blade decurrent; petiole 7-15 mm long *M. macrophylla*
- Base of leaf blade not decurrent; petiole 15-35 mm long 9

9. Leaf blade 3.8-4.7 cm wide, with 16-21 pairs of secondary veins, base acute *M. bemangidiensis*
 — Leaf blade 4.7-9.3 cm wide, with 20-24 pairs of secondary veins, base cuneate *M. kotozafii*

CLÉ DES ESPÈCES DE *MICRONYCHIA* OLIV.

1. Feuilles entièrement glabres sur les deux faces 2
 — Feuilles avec au moins quelques trichomes sur une face 6
2. Feuilles à apex arrondi, émarginé ou rétus 3
 — Feuilles à apex aigu à longuement acuminé 4
3. Limbe foliaire 3-11,5 cm de long; pétiole 3-15 mm de long; sépales 1,5-2,5 × 1,8-2,5 mm *M. tsiramiramy*
 — Limbe foliaire 2-6,5 cm de long; pétiole 2-6 mm de long; sépales 1 × 1 mm *M. minutiflora*
4. Feuilles les plus grandes de moins de 8 cm de long; distance entre deux nervures secondaires dans la partie médiane du limbe moins de 1 cm *M. acuminata*
 — Feuilles les plus grandes d'au moins 8 cm long; distance entre deux nervures secondaires dans la partie médiane du limbe d'au moins 1 cm 5
5. Feuilles opposées; pétiole moins de 10 mm de long; infrutescence 2,5-5 cm de long; surface des fruits à stries marquées *M. striata*
 — Feuilles alternes; pétiole au moins (8-)10 mm de long; infrutescence c. 10 cm de long; surface des fruits à striation indistincte *M. benono*
6. Limbe foliaire obovale à elliptique 7
 — Limbe foliaire oblancéolé 8
7. Limbe foliaire 4-9 × 2-4,5 cm, avec 8-13 paires de nervures secondaires craspédodromes *M. madagascariensis*
 — Limbe foliaire 8,5-22 × 4,5-11 cm, avec 20-25 paires de nervures secondaires camptodromes *M. danguyana*
8. Base du limbe foliaire décurrente; pétiole 7-15 mm de long *M. macrophylla*
 — Base du limbe foliaire non décurrente; pétiole 15-35 mm de long 9
9. Limbe foliaire 3,8-4,7 cm de large, à base aiguë, avec 16-21 paires de nervures secondaires *M. bemangidiensis*
 — Limbe foliaire 4,7-9,3 cm de large, à base cunée, avec 20-24 paires de nervures secondaires *M. kotozafii*

SYSTEMATICS

Genus *Micronychia* Oliv.1. *Micronychia bemangidiensis*

Randrian. & Lowry, sp. nov.

(Fig. 1)

Haec species quoad petiolum 15-35 mm longum etiam laminam foliarem oblanceolatam basi non decurrentem

subtus secus costam tomentosam ad Micronychiam kotozafii maxime accedit, sed ab ea lamina foliari 3.8-4.7 cm lata basi acuta nerviorum secundariorum in paribus 16 ad 21 distinguitur.

TYPUS. — **Madagascar.** Prov. Toliara, Iabakoho, Antsotso Avaratra, Ivohibe, low elevation humid forest, 24°34'13"S, 47°12'02"E, 334 m, 21.V.2006, fl., *Birkinshaw et al.* 1622 (holo-, MO!; iso-, G!, K!, MO!, NY!, P!, TAN!).



FIG. 1. — *Micronychia bemangidiensis* Randrian. & Lowry: **A**, flowering branch; **B**, unopened flower; **C**, longitudinal section of unopened male flower; **D**, tip of male inflorescence. Birkinshaw et al. 1622. Scale bars: A, 2 cm; A', 6.5 mm; B, C, 2 mm; D, 4 mm.

PARATYPES. — **Madagascar.** Prov. Toliara, Iabakoho, Antsoaso Avaratra, Ivohibe, low elevation humid forest, 24°34'13"S, 47°12'02"E, 334 m, 21.V.2006, fl., *Birkinshaw et al.* 1634 (G, K, MO, NY, P, TAN).

DESCRIPTION

Small tree 3–4 m tall, dioecious; twigs densely rusty-brown sericeous-tomentose toward the tips. Leaves alternate, sometimes subopposite, chartaceous, adaxially glabrous, abaxially sparsely tomentose along midvein, 11.4–22.7 × 3.8–4.7 cm, oblanceolate, base acute, apex usually acuminate, sometimes rounded, midvein abaxially prominent, secondary venation camptodromous, 16 to 21 pairs, abaxially prominent, less prominent adaxially, 1.1–2.1 cm from each other in median portion of blade, tertiary veins distinctly visible abaxially. Petiole 15–35 mm long, densely rusty-brown sericeous-tomentose. Inflorescence a terminal, pendent panicle, 8.5–21.5 cm long, densely deep golden brown to rusty-brown sericeous-tomentose. Staminate flowers large, 5–7 mm long; pedicel 5 mm long; sepals 2.1 × 2 mm, ovate, imbricate, adaxial surface glabrous, abaxial surface sericeous; petals 6 × 2.2 mm, ovate, imbricate, adaxially glabrous, abaxially sericeous; stamens 5, filaments 3 mm long, S-shaped, glabrous, anthers 2.2 × 2 mm, ovate with a few sericeous trichomes; disk glabrous, slightly cup-shaped, 2 mm in diam.; ovary reduced. Pistillate flower and fruit not seen.

REMARKS

Micronychia bemangidiensis is only known from two collections with staminate flowers, both from low elevation humid forest on the eastern slope of Ivohibe peak c. 55 km N of Fort Dauphin, in extreme SE Madagascar (Fig. 2). This species can be easily distinguished from other members of the genus by the combination of its narrow and long oblanceolate leaf blade with an acute base and long petiole. It resembles *M. kotozafii* Randrian. & Lowry in having petioles that exceed 15 mm in length, but differs in having narrower leaf blades (3.8–4.7 vs. 4.7–9.3 cm) with fewer pairs of secondary veins (16 to 21 vs. 20 to 24 pairs) and an acute (vs. cuneate) base.

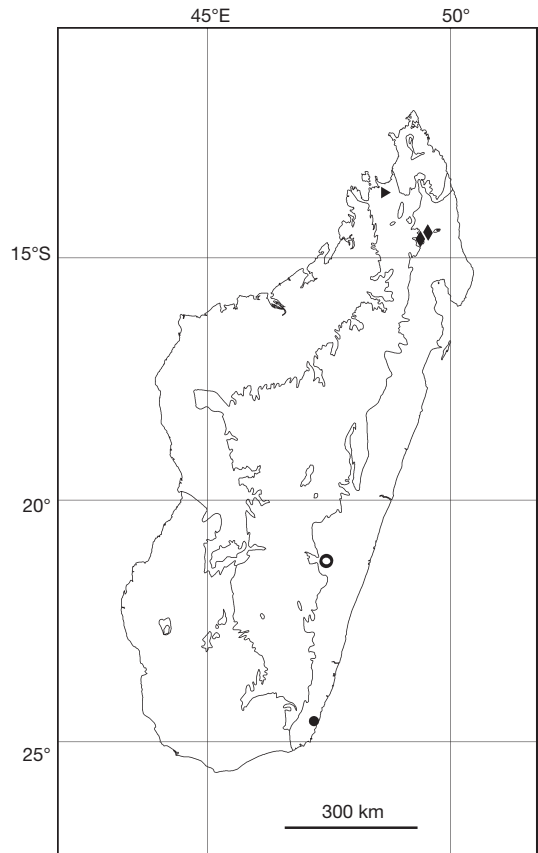


FIG. 2. — Distribution of *Micronychia* Oliv. species, mapped on the bioclimatic zones of Madagascar (after Cornet 1974; see Schatz 2000): *M. bemangidiensis* Randrian. & Lowry (●), *M. benono* Randrian. & Lowry (▴), *M. kotozafii* Randrian. & Lowry (○), *M. striata* Randrian. & Lowry (◆).

ETYMOLOGY

The species name refers to the Bemangidy forest, located in the central part of the Tsitongambarika range, the easternmost mountain chain in southern Madagascar. Bemangidy appears to be of exceptional conservation importance, as it is one of the last remaining areas of well-preserved low elevation humid forest in the region, extending down to below 100 m above sea level. Recent botanical inventory work has yielded material of several new species, including *Gnidia razakamalalana* Z.S.Rogers (Thymelaeaceae) (Rogers 2006) and seven as-yet unpublished species of Araliaceae (Lowry unpubl. data).

VERNACULAR NAME

Rehika.

CONSERVATION STATUS

With an Extent of Occurrence (EOO) of less than 100 km², an Area of Occupancy (AOO) of no more than 10 km², and a single known location situated outside Madagascar's protected areas system, *Micronychia bemangidiensis* is assigned a preliminary status of Critically Endangered (CR B1ab(i,ii,iii)+2ab(i,ii,iii)) using the IUCN Red List threat criteria (IUCN 2001).

2. *Micronychia benono*

Randrian. & Lowry, sp. nov.

(Fig. 3)

Haec species quoad laminam foliarem utrinque glabram 8-15 cm longam apice plerumque acutam usque acuminatam, in medio nerviis secundariis inter se 12 cm distantibus ad Micronychiam striatam maxime accedit, sed ab ea foliis alternis, petiolo (8-)10-14 mm longo, infructescentia c. 10 cm longa atque fructu indistincte striato distinguitur.

TYPUS. — **Madagascar.** Prov. Antsiranana, Ambilobe, Beramanja, Anketrabe, forêt de Kalabenono, sommet rocheux, végétation basse riche en Araliaceae, 13°38'51"S, 48°40'32"E, 818 m, 23.XI.2006, fr., *Callmänder, Jo Vasaba & Malaza 574* (holo-, MO!; iso-, G!, K!, MO!, P!, TAN!).

PARATYPES. — **Madagascar.** Prov. Antsiranana, Ambilobe, Beramanja, Anketrabe, forêt de Kalabenono, chaîne de Galoko, 9 km au SE d'Anketrabe, forêt humide de moyenne altitude, sur colline, 13°38'59"S, 48°40'41"E, 785 m, 24.XI.2006, fr., *Razafitsalama & Torze 1129* (G, K, MO, NY, P, TAN).

DESCRIPTION

Shrub to c. 6 m tall, main stems 6 cm in diam., presumably dioecious; twigs densely lenticellate toward the tips, otherwise glabrous. Leaves alternate, thick chartaceous to subcoriaceous, glabrous on both surfaces, 8.5-15 × 2.6-4.8 cm, elliptic to slightly ovate or obovate, base cuneate to attenuate, apex acute to acuminate, midvein abaxially prominent, secondary venation camptodromous, 12-18 pairs, abaxially prominent, adaxially less prominent, 1.2-1.8 cm from each other in median portion of blade, tertiary veins distinctly evident abaxially, less so adaxially.

Petiole 8-14 mm long, glabrous. Flowers not seen. Infructescence a terminal, pendant panicle, c. 10 cm long, glabrous, lenticellate toward the base, primary axis pendant, secondary axes well spaced, borne at nearly 90° angles, distal portions arching upward. Fruits drupaceous, mango-shaped, asymmetric, ovoid to ellipsoid, 1.2-1.6 × 0.6-1 cm, with obscure striations, surface whitish or greenish with a white powdery glaucescence when fresh, dry fruits with evenly-spaced darker lines, often obscured when the membranous exocarp becomes detached.

REMARKS

Micronychia benono is only known from two collections in fruit made in mid-elevation humid forest on sandstone at Kalabenono, which forms part of the Galoko mountain chain in Ambilobe District, SW of Antsiranana (Fig. 2). This species has glabrous leaves with an acuminate or acute apex like those of *M. striata* Randrian. & Lowry, but differs in having alternate leaves, a longer petiole (8-14 vs. 2-6 mm), and an infructescence with well-spaced and almost perpendicular secondary branching.

ETYMOLOGY

The specific epithet refers to the distinctly shaped, isolated Kalabenono massif, where recent botanical exploration has revealed many new species, including the one described here.

CONSERVATION STATUS

With an Extent of Occurrence (EOO) of less than 100 km², an Area of Occupancy (AOO) no more than 10 km² and a single known location at an unprotected site, *Micronychia benono* is assigned a preliminary status of Critically Endangered (CR B1ab(i,ii,iii)+2ab(i,ii,iii)) by application of the IUCN Red List threat criteria (IUCN 2001).

3. *Micronychia kotozafi*

Randrian. & Lowry, sp. nov.

(Fig. 4)

Haec species quoad petiolum 15-35 mm longum etiam laminam foliarem oblanceolatam basi non decurrentem subtus secus costam tomentosam ad Micronychiam bemangidiensem

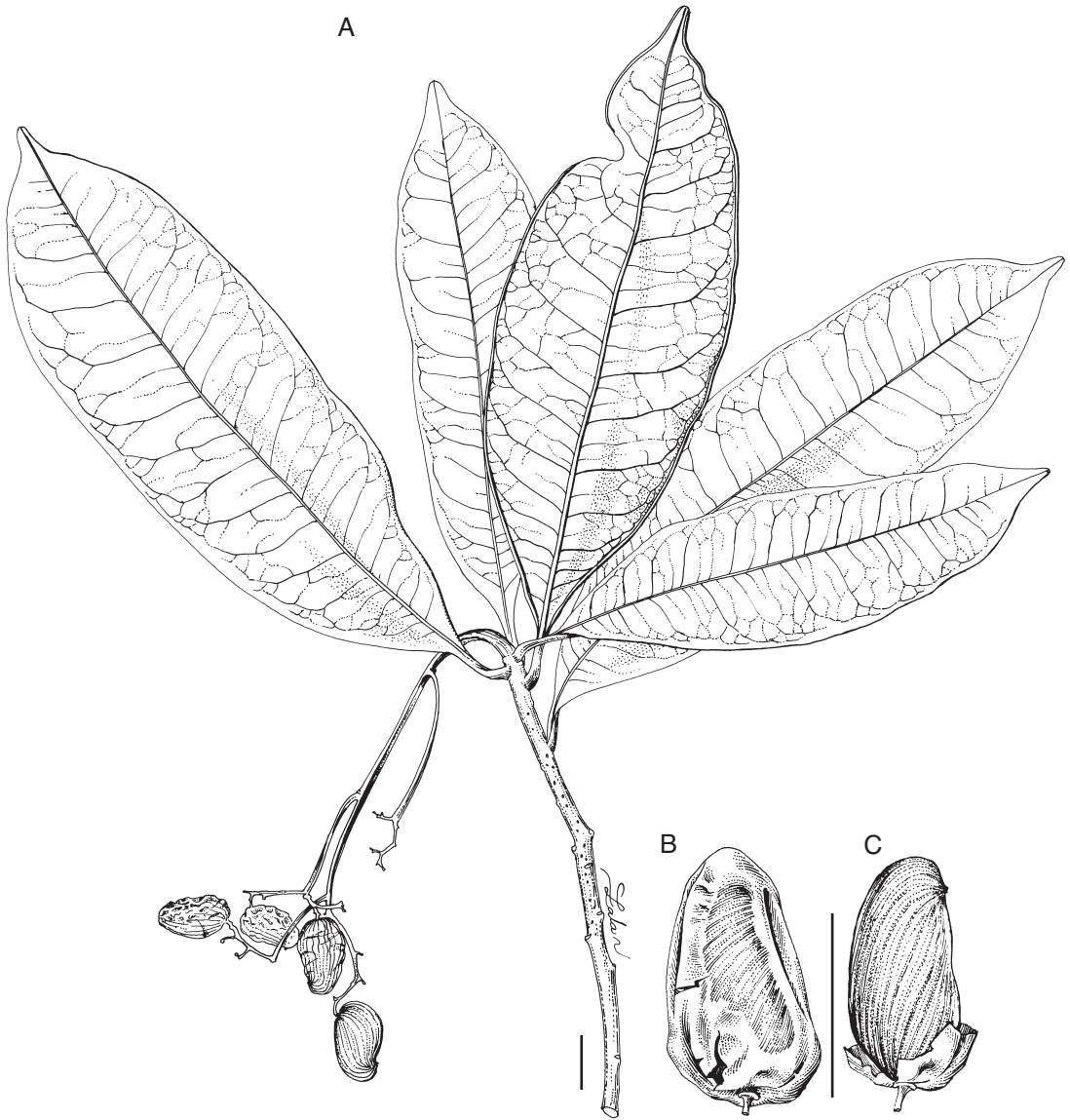


FIG. 3. — *Micronychia benono* Randrian. & Lowry: **A**, fruiting branch; **B**, **C**, details of fruit. *Calmander et al.* 574. Scale bars: 1 cm.

maxime accedit, sed ab ea lamina foliari 4.7-9.3 cm lata basi cuneata nerviorum secundariorum in paribus 20 ad 24 distinguitur.

TYPUS. — **Madagascar.** Prov. Fianarantsoa, Ranomafana National Park, ridgetop above the river valley, 21°16'19"S, 47°26'43"E, 885 m, 30.V.2004, fl., *Rogers et al.* 717 (holo-, MO!; iso-, G!, K!, NY!, P!, TAN!).

PARATYPES. — **Madagascar.** Prov. Fianarantsoa, Ranomafana National Park, parcelle #3, Talatakely, 21°15'S, 47°27'E, 800-1000 m, 15-30.VI.1993, fl., *Kotozafy* 51 (MO, TAN).

DESCRIPTION

Small tree 4-8 m tall, dioecious; twigs brown tomentose and lenticellate toward tips. Leaves alternate,



FIG. 4. — *Micronychia kotozafii* Randrian. & Lowry: **A**, flowering branch; **B**, **C**, details of female flower; **D**, petal and bract lobe. Rogers 717. Scale bars: A, 2 cm; B, 5 mm; C, D, 4 mm.

subcoriaceous, adaxially glabrous, abaxially sparsely sericeous-tomentose along the midvein, secondary veins and proximal portion of margin, 14.9-31 × 4.7-9.3 cm, oblanceolate, base cuneate, apex acuminate, shortly acuminate or rounded, midvein abaxially very prominent, secondary venation cladodromous, 20 to 24 pairs, abaxially prominent, 1-2 cm from each other in median portion of blade, tertiary veins abaxially

very prominent. Petiole 15-25 mm long, sericeous-tomentose. Inflorescence a terminal, pendant panicle, 19-28.5 cm long, axes and young stems densely rusty-brown velutinous, the trichomes mostly erect. Staminate flowers not seen. Pistillate flowers red, large, 6-8 mm long; pedicel short, *c.* 0.2-0.3 mm long; sepals 2 × 1.5-2 mm, widely ovate, imbricate, abaxially pubescent, adaxially glabrous; petals 8 ×

2–4 mm, ovate, imbricate, abaxially sericeous-pubescent, adaxially glabrous; staminodes 5, 1.5–1.7 mm long, filaments *c.* 1–1.2 mm long, straight, glabrous, anthers glabrous, *c.* 0.5 mm long, ovate; disk cup-shaped, *c.* 2 mm in diam., glabrous; ovary glabrous, 1 × 1 mm, very widely ovate, style 6–8 mm long, more or less flattened, gynobasic, divided apically into three branches, stigma capitate. Fruit not seen.

REMARKS

Micronychia kotozafii is known only from two collections with pistillate flowers gathered at Ranomafana National Park, where it co-occurs with two other members of the genus, *M. macrophylla* H.Perrier and *M. minutiflora* (H.Perrier) Randrian. & Lowry (Fig. 2). Morphologically, this new species closely resembles *M. macrophylla*, but can be readily distinguished by its longer petioles (15–25 vs. 7–15 mm) and its cuneate (vs. decurrent) leaf base.

ETYMOLOGY

The species epithet honours Alphonse Kotozafy, who made more than 1000 collections at Ranomafana between 1993 and 1996, and worked at the park as an employee of the Association nationale pour la Gestion des Aires protégées (ANGAP) until his recent untimely death. We dedicate this species to his memory.

VERNACULAR NAME

Sehana.

CONSERVATION STATUS

Because *Micronychia kotozafii* occurs exclusively within a protected area (Ranomafana National Park) and no future decline is therefore expected with regard to AOO, EOO or suitable habitat, this species is assigned a preliminary status of Least Concern (LC) according to the IUCN Red List threat criteria (IUCN 2001).

4. *Micronychia minutiflora* (H.Perrier) Randrian. & Lowry, comb. et stat. nov.

Micronychia tsiramiramy H.Perrier var. *minutiflora* H.Perrier, *Mémoires du Muséum d'Histoire naturelle*,

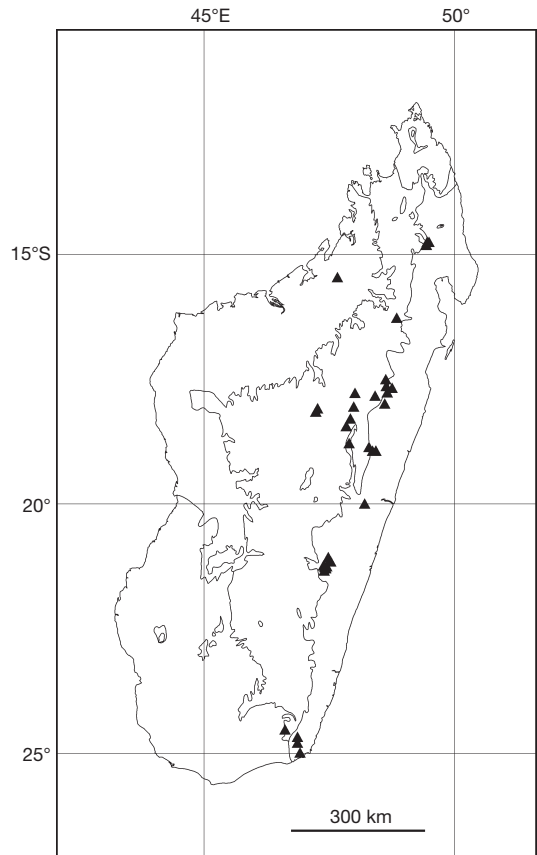


FIG. 5. — Distribution of *Micronychia minutiflora* (H.Perrier) Randrian. & Lowry, mapped on the bioclimatic zones of Madagascar (after Cornet 1974; see Schatz 2000).

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

REMARKS

In Randrianasolo's recent revision of *Micronychia* (2000), this taxon was recognized as a variety within *M. tsiramiramy*. However, careful re-examination of the material now available, which includes many collections made in recent years, reveals that *M. minutiflora* is better treated as a distinct species. It can easily be distinguished from *M. tsiramiramy* by its smaller leaf blades (2–6.2 vs. 3–11.5 cm long) with a shortly acuminate to rounded, or very rarely

emarginate apex (vs. predominantly emarginate and rarely rounded in *M. tsiramiramy*), much shorter petioles (3–6 vs. 3–15 mm), and smaller fruits (0.8–1.2 × 0.6–1.1 vs. 1.2–1.4 × 1.5 cm).

Micronychia minutiflora occurs in a wide variety of habitats throughout much of eastern Madagascar and the Sambirano region in the northwestern part of the island, ranging from humid forest at low altitude (c. 100 m) to montane forest up to 1500 m (Fig. 5).

CONSERVATION STATUS

Micronychia minutiflora has a large Extent of Occurrence (EOO = c. 138 000 km²) and Area of Occupancy (AOO = 306 km²), and 32 subpopulations, of which 20 (60%) occur within six protected areas (Ambohitantely, Analamazaotra, Andohahela, Anjanaharibe-Sud, Ranomafana and Zahamena). Following the IUCN Red List threat criteria (IUCN 2001), this species is assigned a preliminary status of Least Concern (LC).

5. *Micronychia striata*

Randrian. & Lowry, sp. nov.
(Fig. 6)

Haec species quoad laminam foliarem utrinque glabram 8–15 cm longam apice plerumque acutam usque acuminatam, in medio nerviis secundariis inter se 12 cm distantibus ad Micronychiam benono maxime accedit, sed ab ea foliis oppositis, petiolo 26 mm longo, infructescentia 2.5–5 cm longa atque fructu manifeste striato distinguitur.

TYPUS. — **Madagascar.** Prov. Antsiranana, Andapa, Doany, Andranomilolo, forêt dense humide de moyenne altitude située au pied du sommet d'Anjanaharibe "Nord", 14°28'55"S, 49°32'43"E, 1098 m, 24.XI.2006, fr., *Rakotovo* et al. 3518 (holo-, MO!; iso-, P!, TAN!).

PARATYPES. — **Madagascar.** Prov. Antsiranana, massif de l'Anjanaharibe (pentes et sommet nord) à l'ouest d'Andapa (haute Andramonta, bassin de la Lokoho: Nord-Est), forêt ombrophile sur gneiss et granite, [14°36'S, 49°23'E], 700 m, 10.XII.1950–3.I.1951, fr., *Humbert et al.* 24518 (K, MO, NY, P [2 sheets]). — Anjanaharibe (W du district d'Andapa), campement 2, [14°36'S, 49°23'E], 880 m, 12.XII.1950, fr., *Service Forestier (Capuron)* 913 (MO, P [2 sheets]). — District Andapa, Doany Anala, [14°28'S, 49°32'E], 24.VI.1951, fl., *Service Forestier (Capuron)* 3656 (P, TEF).

DESCRIPTION

Trees 8–25 m tall, dioecious; twigs glabrous. Leaves opposite, subcoriaceous, glabrous on both surfaces, 8–14 × 3.6–5.8 cm, obovate, base cuneate, apex usually shortly acuminate, rarely emarginate, midvein abaxially prominent, secondary venation camptodromous, 10 to 16 pairs, prominent, 1–2 cm from each other in median portion of blade, tertiary venation visible, more so abaxially. Petiole 2–6 mm long, glabrous, shallowly canalliculate above. Staminate flowers small, c. 2 cm long; pedicel c. 0.3–0.5 mm long; sepals 1 × 1 mm, widely ovate, imbricate, glabrous on both surfaces; petals 2–3 × 1.5 cm, ovate, imbricate, glabrous on both surfaces; stamens 5, filaments 1 mm long, broadened at the base, glabrous, anthers 1–1.5 mm long, oblong, glabrous; disk dish-shaped, 1 mm in diam., glabrous; ovary very reduced. Pistillate flower not seen. Infructescence a terminal, erect panicle, glabrous, 2.5–5 cm long; secondary axes borne at nearly 90° angles, held perpendicular to the primary axis, higher order axes zigzag in shape. Fruits drupaceous, mango-shaped, asymmetric, widely obovoid, 1.5–1.8 × 1.2–1.5 cm, markedly striate, green to dark green when fresh, yellow tan when dry.

REMARKS

Micronychia striata is known only from humid forest on granitic or gneissic substrate in the Anjanaharibe Sud Special Reserve W of Andapa and from the Anjanaharibe Nord massif near Doany (Fig. 2). Among the species with glabrous leaves, *M. striata* is distinctive in having opposite leaves and markedly striate fruits.

VERNACULAR NAME

Hoditrov.

CONSERVATION STATUS

With an Extent of Occurrence <100 km², an Area of Occupancy of 27 km², and two subpopulations, only one of which occurs within a protected area (Anjanaharibe Sud Reserve), *Micronychia striata* is assigned a preliminary status of Endangered (EN B1ab(i,ii,iii)+2ab(i,ii,iii)) based on the IUCN Red List criteria (IUCN 2001).

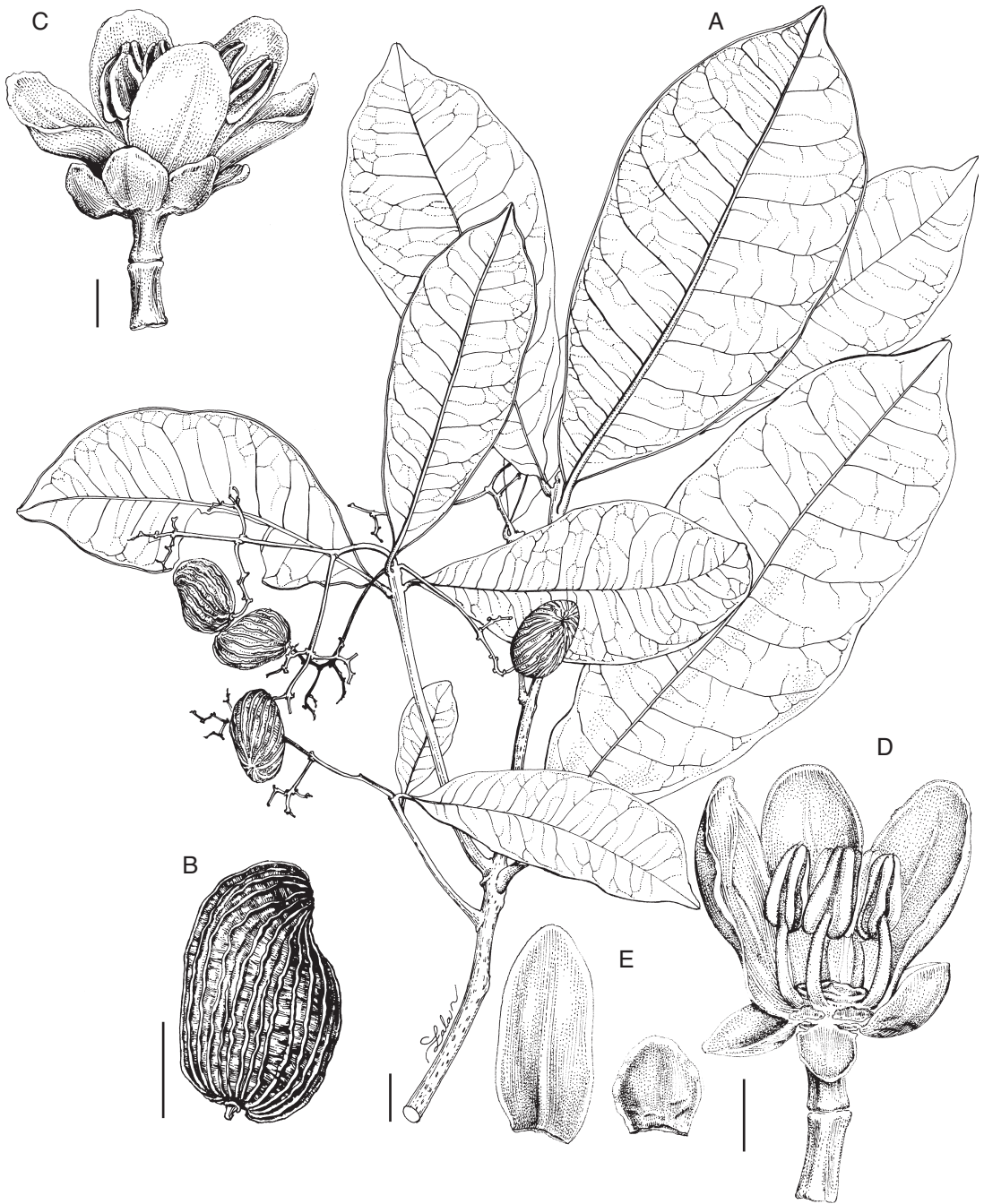


FIG. 6. — *Micronychia striata* Randrian. & Lowry: **A**, fruiting branch; **B**, detail of fruit; **C**, staminate flower; **D**, staminate flower (two petals removed); **E**, petal (left) and sepal (right). A, B, *Rakotova et al.* 3518; C-E, *Service Forestier* 3656. Scale bars: A, 1 cm; B, 8 mm; C-E, 1 mm.

Acknowledgements

We thank Roger Lala Andriamiarisoa for the beautiful illustrations, Frédéric Tronchet for assistance with translating the abstract and key, Roy Gereau for his help with the Latin diagnoses, Duan Bills for preparing the distribution maps, and Susan Pell and John Mitchell for helpful review comments. We are grateful to the curators of several herbaria (P, TAN and TEF) for allowing us to study the specimens deposited in their respective institutions. Special thanks go to Sylvie Andriambololonera and her team for locating specimens in Madagascar and for helping with the conservation assessments. We are also grateful to George Schatz for valuable additional comments on application of the IUCN Red List threat criteria. Fieldwork was conducted under collaborative agreements between the Missouri Botanical Garden and the Parc botanique et zoologique de Tsimbazaza and the Direction de la Recherche forestière et piscicole, FOFIFA. We gratefully acknowledge courtesies extended by the Government of Madagascar (Direction générale de la Gestion des Ressources forestières) and by the Association nationale pour la Gestion

des Aires protégées. This work was conducted with support from the National Geographic Society (Grant #8181-07) and the Beneficia Foundation (both to AR) and from the U.S. National Science Foundation (0743355 to PPL as Co-PI).

REFERENCES

- CORNET A. 1974. — Essai de cartographie bioclimatique à Madagascar. *Notice explicative* 55, ORSTOM, Paris: 1-28.
- IUCN 2001. — *IUCN Red List Categories and Criteria*. Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, 33 p.
- RANDRIANASOLO A. 2000. — A taxonomic revision of the Malagasy endemic genus *Micronychia* (Anacardiaceae). *Adansonia*, sér. 3, 22 (1): 145-155.
- ROGERS Z. S. 2006. — A new species of Malagasy *Gnidia* and the lectotypification of *Octolepis decalepis* (Thymelaeaceae). *Adansonia*, sér. 3, 28 (1): 155-160.
- SCHATZ G. E. 2000. — Endemism in the Malagasy tree flora, in LOURENÇO W. R. & GOODMAN S. M. (eds), *Diversity and endemism in Madagascar. Mémoires de la Société de Biogéographie*. Société de Biogéographie, MNHN, ORSTOM, Paris: 1-9.

*Submitted on 27 November 2007;
accepted on 4 July 2008.*