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A revision of the Malagasy species of Homalium sect. Blackwellia (Salicaceae)

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Abstract

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Homalium sect. *Blackwellia* Benth. *(Salicaceae)* is the largest and most widespread solitary-stamened section of *Homalium* Jacq. As part of a project to update the taxonomy of *Homalium* in Madagascar, a new revisionary treatment of the Malagasy species is presented and an identification key is provided. Fifteen species are recognized, of which four are newly described, and within *Homalium axillare* (Lam.) Benth. a subspecies, *Homalium axillare* subsp. *delphinense* (H. Perrier) Appleq., is recognized. *Homalium acuminatifolium* Appleq. is similar to *Homalium axillare*, but the leaves are usually lanceolate with a long-acuminate apex and the petals often spreading; it is native to the province of Toliara. *Homalium longiracemosum* Appleq. is distinguished by its long racemes and long, narrow, long-petioled leaves; it is endemic to the vicinity of Sainte Luce. *Homalium fortunatii* Appleq. and *Homalium martialii* Appleq. are similar to *Homalium thuarsianum* (Tul.) Baill. in having pubescent sepal glands and paniculate inflorescences. Both of these new species have usually elliptical to narrowly elliptical leaves and are native to northeastern humid forests. *Homalium fortunatii* has minutely pubescent young twigs, while *Homalium martialii* has sepals and petals always shorter than the calyx tube. Occasional hybridization is observed. *Homalium microphyllum* O. Hoffm. is not recognized and the type is believed to be a hybrid involving a species of *Homalium* sect. *Odontolobus* Warb.

Résumé

APPLEQUIST, W.L. (2018). Une révision des espèces de Homalium sect. Blackwellia. (Salicaceae) de Madagascar. *Candollea* 73: 221–244. En anglais, résumés anglais et français. DOI: http://dx.doi.org/10.15553/c2018v732a7

Homalium sect. *Blackwellia* Benth. *(Salicaceae)* est la plus grande section du genre *Homalium* Jacq. possédant une étamine par pétale et la plus grande aire de distribution. Dans le cadre d'une révision taxonomique du genre *Homalium* à Madagascar, une nouvelle révision des espèces malgaches de la section *Blackwellia* est présentée et une clé de détermination est proposée. Quinze espèces sont reconnues, dont quatre sont nouvellement décrites. Une nouvelle sous-espèce *Homalium axillare* subsp. *delphinense* (H. Perrier) Appleq. est reconnue. *Homalium acuminatifolium* Appleq. ressemble à *Homalium axillare*, mais ses feuilles sont lanceolées avec un long apex acuminé et des pétales souvent étalés. Elle est originaire de la province de Toliara. *Homalium longiracemosum* Appleq. est caractérisée par ses longs racèmes et des feuilles longues, étroites, possédant de longs pétioles. Elle est endémique des environs de Sainte Luce. *Homalium fortunatii* Appleq. et *Homalium martialii* Appleq. ressemblent à *Homalium thuarsianum* (Tul.) Baill. par les sépales à glandes pubescents et des inflorescences paniculées. Ces deux espèces nouvellement décrites ont des feuilles elliptiques à étroitement elliptiques et sont originaires des forêts humides du nord-est. *Homalium fortunatii* a des rameaux jeunes pubérulents, tandis que *Homalium martialii* présente des sépales et des pétales toujours plus courts que le tube du calice. L'hybridation entre ces deux espèces est observée occasionnellement. *Homalium microphyllum* O. Hoffm. n'est pas reconnue et son type est considéré comme un hybride lié à une espèce de *Homalium* sect. *Odontolobus* Warb.

Keywords

SALICACEAE – *Blackwellia* – *Homalium* – Madagascar – Taxonomy

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Introduction

Homalium Jacq. is a pantropical woody genus of about 150 known species, formerly placed within *Flacourtiaceae*, that is now known to belong to an expanded *Salicaceae* (Chase et al., 2002; Alford, 2005). As currently circumscribed, the genus encompasses a broad range of floral morphology. The last worldwide treatment (Warburg, 1894) presented a complex classification involving two subgenera (subg. *Blackwellia* (Benth.) Warb. and subg. *Homalium*, defined by having one stamen per petal or fasciculate stamens respectively) and nine sections. Though very little molecular data is available, it is evident from morphology alone that these subgenera are not natural groups, while the monophyly of a few sections is questionable. Hence, this author favors a pragmatic classification that recognizes ten sections not divided into subgenera (Applequist, 2016b). Under that approach, in which sect. *Eumyriantheia* Warb. is restricted to Malagasy species, five of the six sections occurring in Madagascar are endemic, making Madagascar probably the most important center of diversity for the genus.

The Malagasy species of *Homalium* were last revised by Sleumer (1973). Although most species were well dealt with given the material known at that time, the treatment is now obsolete, because the much greater volume of herbarium specimens available today evidently contains representatives of a substantial number of undescribed species. Revisionary studies of all Malagasy subgroups of *Homalium* are therefore in progress, beginning with sect. *Eumyriantheia* (Applequist, 2016a) and sect. *Odontolobus* Warb. (Applequist, 2018). Since three species of sect. *Blackwellia* Benth. are proposed for transfer to sect. *Odontolobus* and it appears that sect. *Odontolobus* may have close affinities to sect. *Blackwellia* (Applequist, 2016b, 2018), sect. *Blackwellia* is logically addressed next.

Material and methods

Standard taxonomic revisionary methods were utilized as described in previous publications dealing with this genus (Applequist, 2016a, 2016b). Herbarium specimens at Paris (P) and St. Louis (MO) were examined, as were then-undistributed duplicates for exchange available at those herbaria and images available through JSTOR of types held by other institutions. Most recent collections, including all those derived from the Missouri Botanical Garden's Madagascar program, have duplicates at TAN or TEF. As these were not seen they are not listed among material examined or paratypes; however, the locations of many such duplicates are available through Tropicos (2018).

Known distributions and habitat are described for each species or subspecies. To save space, locality data are not provided for all specimens seen of common taxa, and those that are provided are edited for brevity, especially when full label data are available from Tropicos (2018). "Fkt." is used throughout as an abbreviation for "fokontany". A complete index of specimens seen is provided as an appendix. Maps of georeferenced specimens may be viewed within the Missouri Botanical Garden's Catalogue of the Plants of Madagascar project (Madagascar Catalogue, 2018), which is continually updated with new determinations and specimens.

A preliminary, unofficial assessment of conservation status using the categories and criteria of IUCN (2012) is provided for each taxon recognized. In instances when the extent of occurrence (EOO) and area of occupancy (AOO) might affect the assessed status, GeoCAT (Bachman & Moat, 2012) was used to estimate those values. Geographic coordinates were taken from label data or approximated from the Missouri Botanical Garden's gazetteer or coordinates estimated in prior georeferencing efforts (Tropicos, 2018); when the specific locality within a protected area was not locatable, the ANGAP centroid coordinates were used.

Taxonomic treatment

Homalium sect. ***Blackwellia*** Benth. in J. Proc. Linn. Soc., Bot. 4: 33. 1859.

≡ *Homalium* subg. *Blackwellia* (Benth.) Warb. in Engler & Prantl, Nat. Pflanzenfam. III(6a): 35. 1893.

≡ *Blakwellia* Comm. ex Lam., Encycl. 1: 428. 1785 [nom. illeg.] [non *Blakwellia* Scop.].

Lectotypus (designated by Sleumer, 1954: 52): *Blakwellia paniculata* Lam. (≡ *Homalium paniculatum* (Lam.) Benth.)

= *Astranthus* Lour., Fl. Cochinch. 1: 221. 1790. **Typus:** *Astranthus cochinchinensis* Lour. (≡ *Homalium cochinchinensis* (Lour.) Druce).

= *Pythagorea* Lour., Fl. Cochinch. 1: 243. 1790. ≡ *Homalium* sect. *Pythagorea* (Lour.) Kuntze in Post & Kuntze, Lex. Gen. Phan., Prop.: 285. 1903. ≡ *Homalium* subg. *Pythagorea* (Lour.) Sleumer, Fl. Males. ser. 1, 5: 52. 1954. **Typus:** *Pythagorea cochinchinensis* Lour. [= *Homalium cochinchinensis* (Lour.) Druce, a heterotypic synonym].

= *Homalium* sect. *Eublackwellia* Warb. in Engler & Prantl, Nat. Pflanzenfam. III(6a): 35, 36. 1893. **Lectotypus** (designated by Applequist, 2016b: 251): *Homalium paniculatum* (Lam.) Benth (≡ *Blakwellia paniculata* Lam.).

= *Homalium* sect. *Paniculata* S.S. Lai [as *Paniculatae*], Bull. Bot. Res., Harbin 14: 222. 1994 [nom. illeg.] [non *Homalium* [unranked] *Paniculata* Benth.]. **Typus:** *Homalium phanerophlebium* F.C. How & W.C. Ko.

= *Homalium* sect. *Racemosa* S.S. Lai in Bull. Bot. Res., Harbin 14: 223. 1994 [as *Racemosae*] [nom. illeg.] [non *Homalium* [unranked] *Racemosa* Benth.]. **Typus:** *Homalium ceylanicum* (Gardner) Benth. (≡ *Blackwellia ceylanica* Gardner).

Stipules axillary, free. *Inflorescences* racemose (to spicate) or paniculate; bracts usually small or narrow, caducous, bracteoles absent [outside Madagascar, sometimes possibly very small and rapidly caducous]. *Flowers* pedicellate to subsessile (sessile) with pedicels usually short, articulated (at least post-anthesis); perianth 6–10(–11)-merous [outside Madagascar, 5–12(–15)-merous]. *Sepals* ligulate to narrowly elliptical (linear, oblong; seldom much reduced), usually modestly accrescent; calyx tube turbinate to narrowly funnelform or tubular, at least in fruit (seldom short, funnelform), usually longitudinally ridged; sepal glands usually small and rounded, rarely elliptical. *Petals* similar in shape and size to sepals or narrowly elliptical to spatulate or oblanceolate (narrowly obovate, oblong-ovate, narrowly deltoid) [outside Madagascar, sometimes markedly longer than sepals], usually modestly accrescent; *sepals and petals* ascending to spreading (usually only in a few flowers at one time), sometimes reflexed in fruit or suberect, ciliate, usually with long or stiff trichomes [outside Madagascar, rarely not ciliate]. *Stamens* 1 per petal, inserted between sepal glands; anthers broader than long, usually small, with subglobose locules diverging at a broad angle, slits of dehiscence often toward the apex [outside Madagascar, sometimes dorsifixed, broadly oblong-elliptical with oblong-elliptical locules and a large connective, the slits of dehiscence nearly parallel]. *Ovary* conical, usually narrowly, in flower (to nearly flat), prominently conical in fruit; styles (2–)3–5(–6) [reportedly 7 in *H. barandae* S. Vidal ex Fern.-Vill.], free to near base. *Locule of fruit* usually elongated [outside Madagascar, rarely to subglobose in very short-flowered species], conical above, pubescent (to glabrate) at least on lower portion; *seeds* usually several per fruit, small, confined to apical portion of ovary.

Notes. – *Homalium* sect. *Blackwellia* is the most widespread section of *Homalium*, ranging from Madagascar, South Africa and the Mascarenes to Asia, Malesia, Australia, and various Pacific islands. Its characteristic features include an ovary whose free portion is usually relatively narrow and strongly conical, at least in fruit; an elongated or narrow, often prominently ridged calyx tube; often narrow, often relatively numerous sepals and petals that are usually ciliate and moderately accrescent in fruit; and the absence of paired bracteoles below flowers. All Malagasy species of the section have glabrous leaves and small anthers with subglobose locules; their sepals and petals are similar or only modestly different in size and usually not very different in shape, and have similar indument.

Three species formerly recognized in *Homalium* sect. *Blackwellia* (Sleumer, 1973), namely *H. brachystylis* (Tul.) Baill., *H. longistaminum* H. Perrier, and *H. planiflorum* (Boivin ex Tul.) Baill., have been transferred to *Homalium* sect. *Odontolobus* (Applequist, 2016b, 2018). That section, which like several others has only one stamen per petal, is more similar to *Homalium* sect. *Blackwellia* than any other Malagasy section and might have evolved within *Homalium* sect. *Blackwellia* as presently defined. *Homalium* sect. *Odontolobus* has usually broad and persistent bracts, and usually two small bracteoles per flower; the flowers are frequently borne in clusters. The flowers have relatively broad calyx tubes, small perianth parts that are usually more or less spreading (with the sepals often much smaller than the petals) and hardly accrescent, and an ovary that is nearly flat to shallowly conical at anthesis, becoming nearly hemispherical rather than narrowly conical in fruit. The ovary locule is sparsely pubescent to glabrous and, though mature seeds are seldom seen, there is often only one large seed that fills the locule.

Fruits of *Homalium* are very small capsules, with few significant characters distinguishing species, and the flowers are typically lost as a unit during maturation, so specimens with mature seeds are too rare to be useful. Hence, only floral and vegetative characters are used in the circumscription of species.

Though *Blakwellia* Lam. was illegitimate as a later homonym, many species of *Homalium* sect. *Blackwellia* and sect. *Polyanthera* Warb. sensu Applequist (2016b) were first published within that genus. The vast majority of later authors corrected the spelling of the name to *Blackwellia*, and authors' original usage is followed in the provision of synonymies herein. Some nomenclaturists might dispute whether Lamarck's spelling is an orthographic error that may be automatically corrected under Art. 60.1 of the International Code of Nomenclature (Turland et al., 2018). Since Lamarck's illegitimate name cannot be treated as a basionym of sect. *Blackwellia* Benth., which was validly published as a new taxon, the spelling of the sectional name would be unaffected by that question.

Key to the Malagasy species of Homalium sect. Blackwellia

1. Sepal glands glabrous 2
1a. Sepal glands pubescent to pilose 5
2. Inflorescences paniculate (rarely partly racemose) ..... 6. ***H. erianthum***
2a. Inflorescences racemose 3
3. Leaves narrowly elliptical (oblanceolate), 2.1–3.3 × 0.5–0.7 cm ..... 5. ***H. decaryanum***

3a. Leaves variably shaped, usually mostly elliptical (broadly or narrowly) or mostly lanceolate, variable in length but consistently > (0.9–)1.1 cm broad; widespread 4

4. Leaves lanceolate (to narrowly lanceolate or ovate), leaf apex long-acuminate; petals often spreading at anthesis; Toliara ..... 1. ***H. acuminatifolium***

4a. Leaves elliptical to narrowly or broadly elliptical (seldom to ovate, obovate, or rarely lanceolate), leaf apex acute to rounded or obtuse (somewhat acuminate); petals usually ascending (to irregularly spreading) at anthesis; widespread ..... 2. ***H. axillare***

5. Inflorescences paniculate, sometimes mostly racemiform with flowers in short clusters then partly cauliflorous 6

5a. Inflorescences racemose, not cauliflorous 9

6. Panicles mostly short-branched to racemiform, partly cauliflorous on large twigs below the most distal leaves; inflorescences, calyx tube and abaxial surface of sepals and petals pilose, usually densely so; sepals and petals linear (narrowly spatulate) ..... 4. ***H. cauliflorum***

6a. Panicles mostly with few well-developed lower branches (partly racemose), lateral (partly pseudoterminal; occasionally borne on small twigs below leaves but not cauliflorous on large twigs); inflorescences, calyx tube and abaxial surface of sepals and petals pubescent (pilose, sparsely so on sepals and petals); sepals and petals ligulate (narrowly lanceolate) 7

7. Leaves elliptical (to narrowly elliptical or somewhat obovate), (3–)3.5–7.6(–9) × (1.7–)2–3.3(–3.7) mm; petioles 2–12(–15) mm; sepals and petals narrowly lanceolate (ligulate), much shorter than (to slightly shorter than) calyx tube ..... 9. ***H. martialii***

7a. Leaves variable in shape and size, if mostly elliptical to narrowly elliptical then mostly > 7.5 × 3.5 cm; petioles ≤ 6.5 mm; sepals and petals ligulate (to narrowly lanceolate), longer than calyx tube to slightly shorter 8

8. Young twigs glabrous; leaves oblanceolate to obovate (oblong-oblanceolate, elliptical), (2.8–)3.5–7.8(–10) × (1.2–)1.6–3.8(–5.2) cm, with base cuneate to convex, apex rounded to somewhat obtuse or acute with rounded apex (shallowly emarginate, rounded-cuspidate), margins entire or subentire (revolute, slightly repand); sepals and petals longer than calyx tube ..... 14. ***H. thuarsianum***

8a. Young twigs minutely pubescent; leaves elliptical to narrowly elliptical (broadly elliptical to obovate in abnormally small leaves), (3.4–)7.5–13 × (1.4–)3.5–5.3 cm, with base convex (to rounded), apex cuspidate with a rounded tip (rounded), margins shallowly repand; sepals and petals slightly shorter than calyx tube to slightly longer .... 7. ***H. fortunatii***

9. Inflorescences glabrous; sepals and petals minutely pubescent with a narrow dark stripe at midrib; dry forest in Mahajanga on limestone ..... 3. ***H. brachyrhachis***

9a. Inflorescences pubescent (to pilose or villous); sepals and petals with variable indument, without a distinct dark stripe; eastern to northeastern and central humid forests 10

10. Flowers (7–)8–9-merous; sepals and petals linear to narrowly ligulate (sepals narrowly spatulate), 2.5–5.5(–6.8) mm, always much longer than the narrow or short calyx tube; inflorescences moderately pilose, calyx tube and abaxial surface of sepals and petals sparsely to moderately pilose ..... 13. ***H. retivenium***

10a. Flowers 6–7-merous (to 8-merous in *H. micranthum*); sepals and petals variable in shape, often ligulate but not linear, to 4.4 mm or less, the ratio of sepal and petal length to calyx tube length variable (often including within species); inflorescences, calyx tube and abaxial surface of sepals and petals pubescent to glabrate (to glabrous, or sparsely pilose in *H. perrieri*) 11

11. Leaves narrowly lanceolate to narrowly elliptical (obovate-elliptical), 7.3–15 × 2.6–3.9 cm with petiole (6.5–)9–18 mm; racemes 9–25 cm .... 8. ***H. longiracemosum***

11a. Leaves variable in shape but not narrowly lanceolate or narrowly elliptical, at most 9.5 × 3.4 cm with petiole to 5(–6) mm (in most species smaller); racemes at most 10 cm, in most species always < 7.5 cm 12

12. Flowers sessile (short-pedicellate); sepals lanceolate-oblong to oblong or obovate, petals oblong-elliptical to obovate, oblong or spatulate, apices acute to cuspidate or rounded ..... 15. ***H. viguieri***

12a. Flowers pedicellate (subsessile); sepals ligulate to narrowly oblanceolate (narrowly elliptical), petals ligulate to spatulate or narrowly lanceolate (narrowly elliptical, narrowly oblanceolate-elliptical), apices always acute 13

13. Leaves obovate, at most 3 × 1.5 cm, with cuneate to convex base and rounded apex, margins few-toothed near apex or subentire with small rounded glands sunk in margins, secondary veins ascending at a narrow angle to midrib, adaxial leaf surface drying pale brown, abaxial surface greenish ..... 11. ***H. myrtifolium***

13a. Leaves variable in shape and size, mostly elliptical to oblong (partly somewhat obovate), margins toothed at least on apical half with elongated glands in tooth apices that often produce exudate, secondary veins at a broad angle to midrib, adaxial leaf surface drying brown to dark brown (greenish), abaxial surface brown (olive) 14

14. Leaves 0.5–2.3 × 0.3–1.4 cm; inflorescences (0.8–)1.4–3(–3.8) cm ..... 12. ***H. perrieri***

14a. Leaves (2.4–)3.7–9.5 × 1.3–3.4 cm; inflorescences (1.8–)2.5–10 cm (often paired, sometimes very numerous) ..... 10. ***H. micranthum***

Taxonomy

1. ***Homalium acuminatifolium*** Appleq., **spec. nova** (Fig. 1).

Holotypus: Madagascar. Prov. Toliara: forêt au S d'Eminiminy, Parcelle I dans la RNI d'Andohahela, 24°39'00"S 46°48'30"E, 0–500 m, 10–26.XI.1993, fl., *Randriamampionona 682* (MO-6087923!; iso-: MO-6087899!, P [P04735190]!, TAN).

Homalium acuminatifolium Appleq. differs from H. axillare (Lam.) Benth. in having lanceolate (to narrowly lanceolate or ovate), acuminate leaves.

Tree to 15 m, 30 cm dbh; young twigs glabrous. *Leaves* lanceolate to narrowly lanceolate (ovate), 4–7.3 × (1.1–)1.3–2.1(–3) cm; petiole 3–8 mm; base convex (rounded); apex long-acuminate; margins shallowly serrate, with glands small, usually protruding at apex of tooth; adaxial surface drying grayish to blackish, greenish or darker brown, abaxial surface pale brown to brown. *Inflorescences* racemose, lateral, (2–)4–10 cm, short-pubescent; flowers pedicellate with pedicels (0.3–)0.5–1.4(–2.3) mm; bracts broadly elliptical to broadly ovate, 0.4–1 mm. *Flowers* 9-merous; calyx tube short with a rounded base, sparsely pubescent; sepals ligulate with acute apex, 1.3–2.3 mm; petals ligulate with acute apex, 1.4–2.3 mm; sepals and petals yellowish-white, probably somewhat accrescent, usually much longer than calyx tube, often spreading and often becoming somewhat reflexed after flowering, densely ciliate with long trichomes, both surfaces sparsely pubescent or adaxial surface sparsely hispid; sepal glands glabrous; filaments 1.7–2.6 mm, sparsely pubescent; ovary densely hispid to pilose; styles 4–5, 1.3–2 mm, basally hispid to pilose.

Vernacular names. – "Hazofotsy" *(Réserves Naturelles 2098);* "Zôra" *(Randriamampionona 682, Réserves Naturelles 2098, 6733).*

Distribution, ecology and conservation status. – Homalium acuminatifolium is native to low- to mid-elevation humid forests in the southeastern part of the province of Toliara; it sometimes occurs along waterways and on laterite and granite. GeoCAT estimates the Extent of Occurrence at c. 791 km^2 and the Area of Occupancy at 28 km^2; there are seven distinct locations, though four of these are within a few km of one another. The species does occur in the protected area of Andohahela, but its habitat outside Andohahela is threatened with continuing degradation. Therefore a conservation status of "Vulnerable" [VU B1ab(iii)+B2ab(iii)] would seem to be warranted.

Note. – Sleumer determined available specimens of this taxon as *H. axillare* (Lam.) Benth. *"forma foliis ovato-lanceol."* The flowers resemble those of *H. axillare* but the leaves are distinctly different in shape, being usually lanceolate (to narrowly lanceolate or ovate) with a long-acuminate apex. Leaf margins are shallowly serrate and the small marginal glands usually protrude from tooth apices. The racemes are sometimes very numerous and crowded and the petals and sepals are more commonly spreading at anthesis, though these characters are variable.

Paratypi. – **Madagascar. Prov. Toliara:** à la base et en avant de la forêt de Manantantely près de Fort-Dauphin, 50–300 m, 1.III.1947, fl., *Humbert 20373* (P); Farafara Vatanibe, W du village de Malamba, au bord de la Belomotse, 24°51'02"S 47°00'20"E, 135 m, 14–18.XI.2009, post-fl., *Rakotovao et al. 4517* (MO); SW de la forêt d'Ankiboriabo, Marovato, parcelle I d'Andohahela RNI, 24°36'S 46°50'E, 250–750 m, 14.XI.1993, fl. & fr., *Randriamampionona 659* (BM, BR, CANB, CAS, G, K, L, M, MO, P, PRE, S, US, USMS); Magatisaka, 24°35'07"S 47°02'15"E, 669 m, 21.XI.2009, fl., *Razakamalala 4774* (MO); Ifarantsa, Fahibe, 11.XII.1950, fl. & fr., *Réserves Naturelles 2098* (P); Fort-Dauphin, Naniliha [Enaniliha], 15.IX.1954, *Réserves Naturelles 6733* (P).

2. ***Homalium axillare*** (Lam.) Benth. in J. Proc. Linn. Soc., Bot. 4: 34. 1859.

≡ *Blakwellia axillaris* Lam., Encycl. 1: 428. 1785.

Lectotypus (designated by Sleumer, 1973: 255): **Madagascar:** *sine loco,* s.d., fl., *Commerson s.n.* (P-JU 14407 image seen; isolecto-: G [G00018417, G00018418, G00018419] images seen, P [P00624058]!).

Tree to 16 m, 26 cm dbh, or large shrub; young twigs glabrous or minutely papillate. *Leaves* elliptical to narrowly or broadly elliptical (seldom to ovate, obovate, or rarely lanceolate), (2–)2.5–7.5(–9.3) × (0.9–)1.1–3.8(–4.3) cm; petiole (1.5–)2–8 mm; base convex (rounded, cuneate); apex acute to rounded or obtuse (somewhat acuminate); margins crenate-serrate, with small or elongated glands at apices of teeth, to subentire; adaxial surface drying darker, brown to greenish or grayish, abaxial surface pale to medium brown (greenish). *Inflorescences* racemose, 1.5–14.5 cm, pubescent; flowers pedicellate with pedicels 0.2–1.8(–2.5) mm (subsessile); bracts oblong-ovate to ovate or lanceolate (suborbicular, oblong-obovate, deltoid), 0.5–1.1(–1.6) mm. *Flowers* 7–10-merous (most commonly 8-merous); calyx tube narrowly funnelform to basally rounded, pubescent; sepals narrowly oblanceolate-oblong to ligulate or narrowly oblong with acute apex, 0.8–3.7 mm; petals narrowly oblanceolate-oblong to ligulate or narrowly oblong with acute apex, 0.8–3.5 mm; sepals and petals whitish to cream or yellow-green (possibly becoming pink or reddish in fruit), accrescent, longer than calyx tube

(very rarely similar in length), ascending to irregularly spreading or partly reflexed (most often in fruit), ciliate with long trichomes, both surfaces sparsely short-pubescent to glabrous; sepal glands glabrous; filaments 0.8–2.4(–3.5) mm, sparsely villous (to glabrate); ovary hispid or pilose to long-pubescent; styles 3–4(–5), 1.3–3 mm (apparently accrescent), basally hispid to pilose.

Notes. – There is substantial geographic variation in morphology within *H. axillare,* which is the commonest species in its section. Specimens from the province of Toamasina have usually relatively large, crenate leaves with usually large, elliptical marginal glands that may occupy much of the apical margins of teeth; the leaves usually dry brown. The type of the species, the locality of which is unknown, falls into this group, as do a few specimens from Antananarivo, Fianarantsoa, and eastern Mahajanga. Their inflorescences are usually 4–14.5 cm long and mostly borne near twig apices, so that they often extend much beyond the leaves. (However, rare specimens from this range have short or poorly developed inflorescences.) Most specimens, including all from Toamasina, have filaments 2–3.5 mm long, though outlying specimens sometimes have short filaments < 1.5 mm long.

Specimens from the remainder of the species' range have relatively short inflorescences (1.3–6 cm, rarely to 8 cm). Their leaves may be toothed or virtually entire, and when they are toothed, the marginal glands are usually small and nearly round; the leaves are much more likely to dry greenish to grayish brown on at least one surface. Their filaments are usually short, 0.6–1.4 mm, though a few specimens with filaments up to 2.4 mm are placed in this group because of their overall morphology. These populations are herein recognized as *H. axillare* subsp. *delphinense* (H. Perrier) Appleq., while the variant native primarily to Toamasina is treated as subsp. *axillare.* Because there is variation within as well as among subspecies in all of the potentially distinguishing characters, they are presumed not to be reproductively isolated. A group of specimens collected contemporaneously at Manongarivo *(McPherson & van der Werff 16356, 16379, 16381, van der Werff & McPherson 13533)* show particularly large variation within a single population, including some characters typical of *H. axillare* subsp. *axillare.*

In northern Madagascar and the province of Fianarantsoa, *H. axillare* subsp. *delphinense* generally occurs at moderate to high altitudes in humid forest, whereas in Toliara, most populations are from littoral or low-altitude coastal forests. Most specimens from Toliara have quite small, entire, pale-colored leaves, and the difference in ecological preferences might well suggest that they should be treated as a distinct subspecies. However, coastal specimens are known that have moderately large, prominently crenate, and/or brown-drying leaves, while a very small-leaved specimen from a high altitude in Toliara is known. Since it is not possible to separate ecologically distinct groups using morphology, they have not been formally recognized. However, the likelihood of geographically correlated genetic variation should be noted.

Sleumer (1973) quoted among specimens seen "*Commerson* (P, P-LA), '*Blackwellia* de Madagascar', P-JU 14407 holotype *Blackwellia axillaris*". Since multiple unnumbered Commerson duplicates exist that have been presumed to be part of the same gathering, this actually constitutes a lectotypification with an erroneous term used. No material corresponding to this collection is locatable in the Lamarck herbarium. There is a second sheet in the main collection in Paris [P00624058], which Sleumer labeled as the "type" of *B. axillaris*; this is an isolectotype. A second specimen at P [P00624059], which bears a Herb. Mus. Paris, Herbier de A.N. Desvaux label, was determined by Sleumer as a "prob[able] isotype" of *B. axillaris*. Only the piece on the upper left of that sheet is actually *Homalium axillare.* The remainder appears to be *H. planiflorum* (Boivin ex Tul.) Baill. The former portion does resemble the Commerson material but there is no clear evidence that it derives from the same collection; the handwriting on the main labels is similar but does not appear to be identical. Hence that sheet is not considered here to be an isotype. There are also three specimens at G that do bear the name of Commerson in their labeling (which is variable) and that have been considered to be type material.

Key to the subspecies of Homalium axillare

1. Leaves mostly elliptical to broadly elliptical, (2.5–)3.6–7.5(–9.3) × 1.5–3.8(–4.3) cm; petiole 4–8 mm; margins crenate-serrate (crenulate, subentire), with glands usually elongated in tooth apices; adaxial surface drying darker, brown (greenish), abaxial surface brown (greenish); racemes (2.6–)4–14.5 cm; filaments (1.3–)2.1–3.5 mm ... . 2a. ***H. axillare*** subsp. ***axillare***

1a. Leaves mostly elliptical to narrowly (broadly) elliptical, (2–)2.5–6.5 × (0.9–)1.1–3.6 cm; petiole (1.5–)2–4(–5) mm; margins crenate-serrulate to subentire, with glands round or slightly elongated; adaxial surface drying darker, usually greenish or grayish, abaxial surface pale to medium brown (greenish); racemes 1.5–8 cm; filaments 0.8–2.4 mm .... 2b. ***H. axillare*** subsp. ***delphinense***

2a. ***Homalium axillare*** subsp. ***axillare***

Tree to 16 m, 26 cm dbh, or large shrub. *Leaves* elliptical to broadly elliptical (seldom to ovate or obovate), (2.5–)3.6–7.5(–9.3) × 1.5–3.8(–4.3) cm; petiole 4–8 mm; margins crenate-serrate (crenulate, subentire), with glands usually elongated in tooth apices; adaxial surface drying darker, brown (greenish),

Fig. 1. – *Homalium acuminatifolium* Appleq. **A.** Flowering branch; **B.** Flowers. [*Randriamampionona 682*, TAN]
[Drawing: R.L. Andriamiarisoa]

abaxial surface brown (greenish). *Inflorescences* (2.6–)4–14.5 cm. *Filaments* (1.3–)2.1–3.5 mm.

Distribution, ecology and conservation status. – *Homalium axillare* subsp. *axillare* is found in mid-elevation to moderately high-elevation humid forests in Toamasina and surrounding provinces; it is once reported on crust. It is relatively common and is found in protected areas including Analamazaotra, Zahamena, and Ranomafana; therefore a preliminary assessment of its conservation status is "Least Concern" [LC].

Vernacular names. – "Hazombato" *(Service Forestier 1047, 1391, 1603, 6628);* Iasiravina *(Service Forestier 14394);* "Marakoditra" *(Service Forestier 7551);* "Maranikoditra" *(Razanatsoa & Marcellin 234);* "Marankoditra" *(Louvel 63, Perrier de la Bâthie 6794, Razanatsoa et al. 45, Service de Colonisation 42, Service Forestier 1603, 4841, Thouvenot 42);* "Maroankoditra" *(Antilahimena et al. 3217, Antilahimena & Félix 3158, Rakotonandrasana et al. 608).*

Selected material examined. – **Madagascar. Prov. Antananarivo:** 10 km SE de Tsinjoarivo, forêt de Mahatsinjo, 19°40'86"S 47°46'12"E, 1550 m, 13.I.1999, fl., *Messmer & Andriatsiferana 679* (MO). **Prov. Fianarantsoa:** Ambatofinandrahana, 20°29'58"S 46°51'37"E, 1411 m, 2.XI.2004, fl., *Andriamihajarivo et al. 409* (MO); Ranomafana National Park, Vohiparara, 21°14'25"S 47°23'38"E, 1100–1200 m, 2.XI.1997, fl., *Malcomber et al. 2856* (BR, G, K, L, MO); Ihorombe, Mahatsijoriaka, 9.XI.1951, fl., *Service Forestier 4841* (P); Fort-Carnot, Ambodivonana, 23.X.1954, fl., *Service Forestier 14394* (P). **Prov. Mahajanga:** Matsoandakana, 15°08'25"S 49°21'04"E, 1037 m, 9.II.2008, fl., *Bernard et al. 725* (MO). **Prov. Toamasina:** Ambatovy forest, Berano village, 18°48'29"S 48°18'50"E, 1060 m, 25.I.2005, fr., *Antilahimena et al. 3217* (G, K, MO, P); Andasibe, Menalamba, Ambatovy, Dynatec camp, 18°51'06"S 48°18'39"E, 1119 m, 18.XII.2005, fl., *Antilahimena & Edmond 4452* (MO, P); Fkt. Andasibe, Analamazaotra, 18°55'22"S 48°25'32"E, 1001 m, 21.XII.2013, fr., *Antilahimena et al. 8838* (MO, P); Analamazaotra, X.1925, fr., *Louvel 63* (P); Ambatovy, Andranovery, 18°05'57"S 48°18'19"E, 1040 m, 27.I.2008, fl., *Phillipson & Antilahimena 6069B* (MO, P); RNI Zahamena, à côté du RNI, 17°45'45"S 48°42'10"E, 953 m, 29.XI.2001, fl., *Rakotonandrasana et al. 608* (MO, P); Analamazaotra, Lac vert, 18°56'20"S 48°25'15"E, 966 m, 12.XII.2013, fl., *Rasoazanany et al. 537* (MO, P); Fkt. Ampitambe, 18°49'12"S 48°20'7"E, 1178 m, 2.II.2005, fl., *Razafindraibe & Antilahimena 15* (MO, P); Ambatovy, Torotorofotsy forest, 18°52'05"S 48°21'27"E, 961 m, 13.I.2005, fr., *Razanatsoa et al. 20* (MO, P); Tsinjoarivo, Ambatolampy, 11.XII.1952, fl., *Service Forestier 6628* (P); Ambotrajanga, Perinet, 17.XII.1952, fr., *Service Forestier 7551* (MO, P); près d'Ankarahara, P.K. 102 de la route Tananarive-Moramanga, rive gauche du Mangoro, 21.XI.1963, fr., *Service Forestier 22924* (P); Andapabe, Ilalanga, 28.I.1967, fr., *Service Forestier 26282* (P).

2b. ***Homalium axillare*** subsp. ***delphinense*** (H. Perrier) Appleq., **comb. & stat. nova.**

≡ *Homalium microphyllum* var. *delphinense* H. Perrier in Mém. Mus. Natl. Hist. Nat. 13: 289. 1940.

Lectotypus (designated here): **Madagascar. Prov. Toliara:** Fort Dauphin, s.d., fl., *Cloisel 199* (P [P00624057]!; isolecto-: BM, L [L0010881] image seen). **Syntypi: Madagascar. Prov. Toliara:** Fort Dauphin, *Cloisel 180* (BM not seen, P not seen); Vinanibe, 23.X.1932, *Decary 10864* (P!, BM, PRE [PRE0602194-0] image seen, S [S10-10152] image seen, TAN [TAN000589] image seen); Cap Ivatra, s.d., fl., *Decary 10912* (MO [MO-5587081]!, P [P00624056]!, G [G00018420] image seen, L [L0010882] image seen); vallée moyenne du Mandrare près d'Anadabolava, mont Vohibaria, 800–810 m (sommet), XII.1933, buds, *Humbert 12626* (P [P00624051]!); Fort-Dauphin, July, *Scott-Elliot 3041* (K [K000231499] image seen, P [P00624055]!).

= *Homalium humblotii* Baill. in Bull. Mens. Soc. Linn. Paris. 1: 574. 1886. **Holotypus: Madagascar:** "Madag. bor.", s.d., fr., *Humblot 582* (P [P00624054]!; iso-: K [K000231500] image seen, LD [LD1215854] image seen, TAN [TAN000243] image seen, US [US00114722] image seen).

Tree to 10 m, 15 cm dbh, or shrub. *Leaves* elliptical to narrowly (broadly) elliptical (seldom to ovate or rarely lanceolate), (2–)2.5–6.5 × (0.9–)1.1–3.6 cm; petiole (1.5–)2–4(–5) mm; margins crenate-serrulate to subentire, with glands round or slightly elongated; adaxial surface drying darker, usually greenish or grayish, abaxial surface pale to medium brown (greenish). *Inflorescences* 1.5–8 cm. *Filaments* 0.8–2.4 mm.

Vernacular names and uses. – "Fotsivony" *(Humbert 12626);* "Hazofotsy" *(Randriatafika & Ramisy 408, Randriatafika & Rabenantoandro 715, Ratovoson 1661);* "Hazombahy" *(Réserves Naturelles 1812, 2303);* "Hazombarorona" *(Cours 2801);* "Hazombato" *(Cours 1898, Gautier et al. 3120);* "Hazombatofotsy" *(Service Forestier 13711);* "Hazombatry" *(Réserves Naturelles 2401);* "Hazondrena" *(Réserves Naturelles 2272);* "Laza laza madiniky" *(Gautier & Derleth 2563);* "Mampay" *(Hong-Wa 21);* "Marankoditra" *(Ramison & Ramisa 110, Randriatafika & Ramisy 263);* "Nefinzaza" *(Cloisel 199);* "Taimboalavo" *(Réserves Naturelles 8936, 10716, Service Forestier 26398);* "Tsilastra" *(Service Forestier 9979);* "Tsivelonatavy" *(Service Forestier 6440);* "Zora" *(Service Forestier 6085, 6396, 7415);* "Zore" *(Réserves Naturelles 1350).*

Wood of *H. axillare* subsp. *delphinense* is used for construction *(Hong-Wa 21, Ratovoson 1661, Réserves Naturelles 1812, Service Forestier 26398)* and manufacture of wooden objects *(Réserves Naturelles 1350).*

Distribution, ecology and conservation status. – *Homalium axillare* subsp. *delphinense* as herein defined is widespread and its habitat is variable, ranging from littoral forest on sand to mid- or somewhat high-elevation humid forests on gneiss. As noted above, though there is regional variation in morphology, that variation is not entirely consistent with reported habitat or altitude. It is possible that two distinct infraspecific taxa exist within this subspecies, but means of consistently

separating them have not been identified. Because of the numerous localities, several of them protected, the subspecies' appropriate conservation status is "Least Concern" [LC].

Notes. – As noted above, this subspecies remains variable and possibly heterogeneous. Sleumer annotated *Cloisel 199* (P) as the lectotype of *H. microphyllum* var. *delphinense* but failed to indicate this choice in print (Sleumer, 1973). Duplicates of three syntypes at BM that are not available through JSTOR are reported based on statements by Sleumer (1973).

Selected material examined. – **Madagascar. Prov. Antsiranana:** RNI de Tsaratanana, 14°02'51"S 48°46'54"E, 1300 m, 27.XI.2000, fl., *Birkinshaw et al. 767* (BR, K, MO); Cne Beramanja, 13°38'40"S 48°40'18"E, 632 m, 22.XI.2007, fl., *Callmander et al. 711* (MO, P); Bekolosy (14°02'S 48°18'E), vallon en amont de la chute de la riv. Bekolosy, 1100 m, 15.XI.1994, fr., *Gautier & Derleth 2563* (MO, P); vallée inférieure de l'Androranga, affluent de la Bemarivo (NE) aux env. d'Antongondriha, mont Anjenabe, 1000 m, 3–7.XI.1950, fl., *Humbert & Capuron 24146* (P); Montagnes au N de Mangindrano jusqu'aux sommets d'Ambohimirahavavy (partage des eaux Mahavavy-Androranga), 1600 m, 19.I-12.II.1951, fl., *Humbert & Capuron 24915* (P); Manongarivo Massif above village of Ambodisakoana, 14°05'S 48°20'E, 16.X.1994, fl., *McPherson & van der Werff 16356* (MO); Daraina, forêt de Binara, 13°16'S 49°36'E, 960 m, 19.XI.2005, fl., *Nusbaumer & Ranirison 1636* (MO, P); Réserve Spéciale de Manongarivo, 14°04'34"S 48°22'29"E, 1100–1350 m, 15.VIII.1994, fl., *Randriambololona et al. 121* (K, MO, P); Sainte Luce, 24°44'27"S 47°10'55"E, 50 m, 19.XI.2011, fl., *Ratovoson 1661* (MO); forêt de Kalabenono, 13°38'59"S 48°40'41"E, 785 m, 24.XI.2006, fl., *Razafitsalama et al. 1117* (MO); Soahita, Ambohimitsinjo, Sambava, 22.X.1957, fr., *Réserves Naturelles 9253* (P); Flanc S de l'Anjenabe, vallée de l'Andromanga, c. 900 m, 5.XI.1950, fl., *Service Forestier 753* (MO, P); crête S du Betsomanga, bassin de l'Androranga, dct. de Sambava, 900 m, 19.XI.1950, fl., *Service Forestier 835* (P); massif de l'Ambohimarahavavy, [Bealanana?] S du plateau de Marofameno, 1500 m, 7.II.1951, fl., *Service Forestier 994* (P); Manongarivo massif, 14°05'S 48°20'E, 500–1000 m, 20.X.1994, fl., *van der Werff & McPherson 13533* (MO); vallée de l'Ambahatra (cours moyen), Maevatanana (haut de pente), 13°54'51"S 48°29'08"E, 380 m, 19.XI.2000, fl., *Wohlhauser et al. 319* (MO, P). **Prov. Fianarantsoa:** Ambodiriana rive droite du fleuve, 700 m, 14.XII.1944, fl., *Cours 1898* (P [2 sheets]); Ambodimanga à Antanambao, 1200 m, 11.X.1945, fr., *Cours 2801* (P); Riambavy Waterfall, 22°08'45"S 46°53'31"E, 1760 m, 8.XI.2003, fr., *Phillipson & Rakotonandrasana 5689* (BR, CAS, G, K, L, MO, P); Tandrokomby, massif de l'Andringitra, R.N. V, 4.X.1948, fl., *Réserves Naturelles 1812* (P [2 sheets]); Ambodirindahy, Sendrisoa, 7.X.1950, fl., *Réserves Naturelles 2272* (P [2 sheets]); RN V, Ambalavao, Zazafo, 23.X.1949, fl. & fr., *Réserves Naturelles 2401* (P [2 sheets]); Antambohobe, 12.III.1960, fl., *Réserves Naturelles 10716* (P); Fenoarivo, Ilakatra, Vohipeno, 20.XI.1952, fl., *Service Forestier 6440* (P); Ifanadiana SW, 19.XII.1953, fr., *Service Forestier 9979* (P); Ampasinambo, Nosy-Varika, 25.XI.1954, fl., *Service Forestier 13711* (P); c^{ton} Amtambohobe, village le plus proche Ankazomby, Lohony, 15.VIII.1967, fl., *Service Forestier 26398* (P); Massif de l'Isalo, à l'W de Ranohira, 20.XII.1968, fr., *Service Forestier 28506* (P). **Prov. Mahajanga:** Fkt. Andranomena, Befandriana Nord, 15°08'14"S 49°21'27"E, 1084 m, 12.II.2008, fl., *Ravelonarivo et al. 2793* (G, MO). **Prov. Toliara:** Réserve Spécial de Kalambatritra, forêt d'Analamaro, 23°28'00"S 46°23'20"E, 1420 m, 6.XI.2004, fl., *Andrianjafy et al. 527* (MO, P); District de Fort-Dauphin, Vinanibe, 23.X.1932, fl., *Decary 10863* (P); Fort Dauphin, forêt de Mandena, 16.III.1985, fr., *Dorr et al. 3978* (MO, P); Petriky Forest, 0–10 m, 25°04'S 46°51'E, 13.III.1989, fl., *Gereau & Dumetz 3260* (MO, P); Ampasimena, Mt Tsimokotra-Vohimavo, 24°20'11"S 47°08'55"E, 542–547 m, 30.XI.2001, fl., *Hong-Wa 21* (MO); Petriky, 25°05'S 46°52'E, 2.XI.1989, fl., *McPherson 14361* (MO, P); Fkt. Sainte Luce, bloc S9, 24°46'28"S 47°09'50"E, 3 m, 4.XI.2003, fl., *Rabenantoandro et al. 1558* (MO, P); Fort-Dauphin, forêt au N de Manafiafy, 12.XI.1990, fl., *Rabevohitra 2442* (MO, P); Ambohisapa, Thalweg à l'E d'Ambatotsorongorongo, 25°05'11"S 46°46'13"E, 31 m, 23.II.2009, fr., *Rakotovao et al. 4402* (MO); Mandromodromotra, 24°55'22"S 47°01'28"E, 9 m, 6.XII.2006, fl., *Ramison & Ramisa 110* (MO); Mahatalaky, forêt de Belavenoka, 24°50'S 47°04'E, 17.XI.2007, fr., *Ramison 410* (MO, P); Station forestière de Mandena (M.16), 30.VIII.2001, fl., *Randriatafika & Ramisy 263* (MO, P); Fkt. Petriky, 25°03'19"S 46°51'55"E, 18.II.2004, fl., *Randriatafika & Ramisy 408* (MO); Antsotso, forêt Ivohibe, 24°33'52"S 47°11'43"E, 386 m, XI.2005, fl., *Razakamalala et al. 2440* (MO, P); Réserve forestière de Mandena, 16.XI.1948, fr., *Réserves Naturelles 1350* (P [2 sheets]); Vinanibe, à l'W de Fort-Dauphin, 7.XII.1968, fl., *Service Forestier 28623* (P).

3. ***Homalium brachyrhachis*** Sleumer in Bull. Jard. Bot. Natl. Belg. 43: 261. 1973.

Holotypus: Madagascar. Prov. Toliara: crêtes et barres calcaires au lieu dit Ankiranja, à 30–35 km de Manja [21°25'S 44°20'E] sur la route de Bevoay [21°50'S 43°52'E], 3–4.XII.1969, fl., *Service Forestier 28953* (P [P04705554]!; iso-: L [L0010886] image seen, TEF [TEF000288] image seen).

Tree to 6–7 m or large shrub; bark platanoid; young twigs glabrous. *Leaves* elliptical to ovate, (2.7–)3.9–6.2 × (2–)2.5–3.5 cm; petiole 11–16 mm; base rounded (convex), the extreme base attenuate; apex short-acuminate to acute (obtuse); margins prominently crenate-serrulate, with glands small, round, inside teeth apices; adaxial surface drying olive, abaxial surface pale green. *Inflorescences* racemose, lateral, 1.5–3.8 cm, glabrous; flowers pedicellate with pedicels 2–3 mm; bracts not seen. *Flowers* 7–8-merous; calyx tube funnelform with rounded base, minutely pubescent; sepals ligulate with acute apex, 1.5–2.5 mm; petals ligulate with acute apex, 1.8–2.5 mm; sepals and petals about equal to calyx tube or slightly longer, ascending (partly spreading to somewhat reflexed), short-ciliate, abaxial surface minutely pubescent with narrow dark stripes, adaxial surface sparsely pubescent; sepal glands pubescent; filaments 1–1.4 mm, glabrous; ovary pubescent; styles 3–4, 0.8–1.4 mm, basally pubescent.

Distribution, ecology and conservation status. – *Homalium brachyrhachis* is the only species of this section known from dry western forest on limestone. It is known from only two contemporaneous collections in northwestern Toliara province, on the road from Manja to Bevoay, representing a single population. No further material has been collected for almost 50 years. The natural vegetation in this region is mostly extirpated and the remnants suffer ongoing threats and anthropogenic degradation; some land in the region is protected, but the original locality is not. This species, if it still exists, may therefore be at imminent risk of extinction. An appropriate preliminary assessment of conservation status is therefore "Critically Endangered" [CR B1ab(iii)+B2ab(iii)].

Additional material examined. – **Madagascar. Prov. Toliara:** crêtes et barres calcaires au lieu dit Ankiranja, à 30–35 km de Manja sur la route de Bevoay, 3–4.XII.1969, fl., *Service Forestier 28936* (P [4 sheets]).

4. ***Homalium cauliflorum*** H. Perrier in Mém. Mus. Natl. Hist. Nat. 13: 290. 1940.

Lectotypus (designated by Sleumer, 1973: 262): **Madagascar. Prov. Antsiranana:** Bemarivo, bords de torrents, 100 m, IX.1912, fl., *Perrier de la Bâthie 2199* (P [P04734103]!; isolecto-: K [K000231495] image seen, L [L0010897] image seen). **Syntypus: Madagascar. Prov. Antsiranana:** Ambahatra, E du massif de Manongarivo, IX.1909, fl., *Perrier de la Bâthie 2325* (P [P04734102]!).

Shrub or tree to 12 m, sometimes with multiple trunks, 12 cm dbh; bark blackish; young twigs glabrous or glabrate. *Leaves* narrowly elliptical (oblanceolate), 5.5–11 × 1.3–3.5 cm; petiole 2–5 mm; base cunate to narrowly convex or somewhat attenuate; apex narrowly acute (to rounded); margins crenate-serrulate with few shallow, sometimes inconspicuous teeth, sometimes slightly revolute, with glands slightly elongated, in margins inside apex of tooth; adaxial surface drying greenish (to grayish, mottled dark, or when immature blackish brown), abaxial surface brown. *Inflorescences* paniculate, relatively often racemiform with short branches, lateral, many cauliflorous on large twigs below most distal leaves, sometimes pseudoterminal, 4–15(–20) cm, pilose; flowers pedicellate with pedicels (0.5–)1.5–3.5(–5) mm; bracts ovate to oblong, elliptical or lanceolate, 0.5–3.5 mm, most rapidly caducous. *Flowers* 8–10-merous; calyx tube funnelform, pilose; sepals linear (very narrowly spatulate) with acute apex, 1.3–3 mm; petals linear (very narrowly spatulate) with acute apex, 1.4–3.5 mm; sepals and petals white to yellowish or the sepals greenish and petals white to greenish white, accrescent, slightly longer than calyx tube to about equal (slightly shorter), ascending (sometimes spreading in a few flowers), long-ciliate, both surfaces pilose; sepal glands pilose; filaments 0.7–1 mm, pilose; ovary pilose; styles 5, 1–1.4 mm, basally sparsely pilose.

Vernacular names. – "Hazomainty" *(Service Forestier 2960);* "Hazombato" *(Service Forestier 7785);* "Jabozahaditro" *(Antilahimena 841);* "Jambaraohoditry" *(Hong-Wa et al. 319).*

Distribution, ecology and conservation status. – *Homalium cauliflorum* is native to low-elevation (once to 500 m) humid forests in Antsiranana; it is reported to occur on gneiss and along rivers and in ravines. The Area of Occupancy is estimated at 60 km² and the Extent of Occurrence at c. 19,700 km²; the species is found in the Tsaratanana and Marojejy Reserves and more than 10 locations are or have been known. Its conservation status is therefore considered to be "Least Concern" [LC].

Additional material examined. – **Madagascar. Prov. Antsiranana:** Ampasindava, forêt d'Andranomatavy, 13°41'41"S 47°59'15"E, 160 m, 27.XI.2009, fl., *Ammann et al. 426* (P); Fkt. Ambobake, Ramena River, 13°45'00"S 48°31'18"E, 251 m, 21.XI.2001, fl., *Antilahimena 841* (MO); Behefaka, Anjahana, forêt d'Ambinanibekona, 13°21'06"S 49°10'06"E, 124 m, 7.VI.2005, fl., *Hong-Wa et al. 319* (MO, P); massif de Marivorahona au SW de Manambato (Haute Mahavavy du Nord, Distr. d'Ambilobe), 500 m, 18–26.III.1951, fl., *Humbert & Capuron 25617* (P); Loky Manambato, village Tsinjrano, aux bords de la riv. Manambato, 13°13'40"S 49°52'36"E, 14 m, fl., 12.X.2013, *Rakotovao et al. 6490* (MO); Daraina, forêt de Binara, 13°14.61'S 49°38.85'E, 100 m, 1.IV.2004, fl., *Ranirison 562* (MO, P); RNI de Marojejy, suivant la riv. d'Androranga, entre Anketsahely et village Antongodriha, 14°18'S 49°42'E, 150–265 m, 3–13.XI.1994, fl., *Rasoavimbahoaka 413* (MO, P); District Sambava, 19.VIII.1956, fl., *Réserves Naturelles 8421* (P); Marovato, district Ambanja, 12.III.1956, fl., *Réserves Naturelles 8611*(P); Antsirabe, Ambanja, 16–30.III.1951, fl., *Service Forestier 2960* (P); env. d'Amb[a]kirano, district d'Ambilobe, s.d., fl., *Service Forestier 3073* (P [2 sheets]); Marojejy, Andapa, 27.X.1953, fl., *Service Forestier 7785* (MO, P); Ambahatra, cours moyen (13°56'S 48°27'E), Bemamboly (rive droite), 140 m, 28.V.2000, fl., *Wohlhauser 60273* (MO).

5. ***Homalium decaryanum*** H. Perrier in Mém. Mus. Natl. Hist. Nat. 13: 288. 1940.

Lectotypus (designated by Sleumer, 1973: 255): **Madagascar. Prov. Fianarantsoa:** Befotaka, [Prov.] de Farafangana, 12.VIII.1926, fl., *Decary 4776* (P [P00375089]!; isolecto-: K [K000231498] image seen, L [L0010902] image seen).

Tree to 3 m; young twigs minutely pubescent. *Leaves* narrowly elliptical (oblanceolate), 2.1–3.3 × 0.5–0.7 cm; petiole 1.5–3 mm; base narrowly cuneate (slightly attenuate); apex acute with rounded tip; margins serrulate, with glands small, rounded, in tooth apices; adaxial surface drying greenish, abaxial surface pale brown. *Inflorescences* racemose, lateral, sometimes paired, (1.3–)2.8–3.7 cm, pilose or long-pubescent; flowers pedicellate with pedicels 0.5–1.4 mm; bracts ovate to lanceolate, 1.4–2.5 mm. *Flowers* 8–9-merous; calyx tube funnelform, long-pubescent; sepals ligulate with acute apex, 1.7–2.1 mm; petals ligulate with acute apex, 1.7–2.4 mm; sepals and petals white, accrescence unknown, longer than calyx tube, ascending (few spreading to reflexed), ciliate with long soft trichomes, abaxial surface sparsely appressed-pubescent, adaxial surface densely pilose; sepal glands glabrous; filaments 0.6–0.7 mm, glabrous or glabrate; ovary pilose; styles 3–4, 0.7–0.8 mm, pilose.

Vernacular name. – "Kidravy" *(Decary 4776).*

Distribution, ecology and conservation status. – The only known collection is from Befotaka, an area of humid forest near Midongy du Sud in Fianarantsoa, near water. Most of the remaining forest in that area is protected. However, the fact that this species has not been recollected for over 90 years suggests that it is quite rare and of limited distribution, so that

all remaining individuals could be affected by a single extreme event such as a typhoon. Its conservation status is therefore suggested to be "Vulnerable" [VU D2].

Note. – Sleumer (1973) termed the duplicate of *Decary 4776* at P the "holotype". That was certainly the specimen used by Perrier de la Bâthie, but he did not overtly state that only material at P was used, and there is a duplicate at K. Therefore these are syntypes (the fragment at L that must have been taken from one of them has a lesser standing) and Sleumer's declaration actually constitutes an effective lectotypification.

6. ***Homalium erianthum*** (Tul.) Baill. in Bull. Mens. Soc. Linn. Paris 1: 574. 1886.

   ≡ *Blackwellia eriantha* Tul. in Ann. Sci. Nat., Bot. ser. 4, 8: 62. 1857.

   Lectotypus (first step designated by Sleumer, 1973: 257; second step designated here): **Madagascar. Prov. Antsiranana:** Nossi-bé, bords de la riv. de Djabal, II.1849, fl., *Boivin 2125* (P [P00624053]!; isolecto-: BM, G [G00018409] image seen, L [L0010916] image seen, P [P00624052]!). **Syntypus:** "Provenit etiam in insula Mauritiana" [cultivated], *Commerson s.n.* (P, not seen).

Tree to 22 m, 26 cm dbh; bark platanoid; young twigs sparsely short-pubescent to glabrous (moderately pubescent). *Leaves* elliptical to narrowly (broadly) elliptical (seldom somewhat ovate), 6–13(–15) × 2–6.6 cm; petiole (4–)6–9(–13) mm; base convex (rounded); apex short-acuminate, acute to obtuse, or rounded; margins crenate-serrulate (barely repand), with glands small, in margins of tooth apices; adaxial surface drying darker brown (to near black, paler, or grayish), abaxial surface brown (greenish). *Inflorescences* paniculate (rarely partly racemose), lateral and pseudoterminal, (3–)5.5–15.5 cm, short-pubescent, rarely to villous; flowers pedicellate with pedicels (0.6–)1–5(–6) mm; bracts ovate to elliptical, lanceolate or ligulate, 0.8–3.5 mm. *Flowers* 9–10(–11)-merous; calyx tube long-funnelform with rounded base, moderately to sparsely short-pubescent; sepals ligulate (to narrowly oblong, narrowly deltoid) with acute apex, 1.4–4 mm; petals ligular to narrowly spatulate (narrowly elliptical, oblanceolate) with acute apex, 1.4–4.2 mm; sepals and petals white to pale yellowish green or cream, accrescent, moderately shorter or longer than calyx tube, ascending (seldom partly spreading, then reflexing after anthesis), ciliate mostly towards apex, both surfaces sparsely pubescent (sometimes sparsely villous to pilose adaxially); sepal glands glabrous; filaments 1.5–2.4 mm, moderately pilose to villous; ovary sparsely pilose to villous; styles 5, 1.3–2(–3) mm, basally sparsely pilose to villous.

Vernacular names. – "Hompa" *(Service Forestier 12037);* "Sarigidroa" *(Service Forestier 15786);* "Zahamena" *(Service Forestier 15958).*

Distribution, ecology and conservation status. – *Homalium erianthum* is primarily native to low-elevation humid forests in the province of Antsiranana, rarely found farther southwest in Mahajanga. It is reported to grow on gneiss and quartzite. The species may be uncommon, as it has not been recollected in some well-botanized areas for several decades. The Area of Occupancy is estimated at 52 km² and the Extent of Occurrence at c. 74,100 km². Though most of the habitat is threatened by ongoing anthropogenic damage, the species has been collected in the protected areas of Montagne d'Ambre and Namoroka. More than ten distinct locations are known. Therefore the species' conservation status is tentatively assessed as "Least Concern" [LC]; however, this may understate its rarity.

Notes. – Among species of *Homalium* sect. *Blackwellia* with glabrous glands, *H. erianthum* is the only species with well-developed paniculate inflorescences and has unusually large leaves. Sleumer (1973) incorrectly cited the material of *Boivin 2125* at P as the holotype, which at the time constituted an effective lectotypification. However, since there are actually two duplicates at P, a second-stage lectotypification should select one of them as lectotype. The duplicate chosen has a more complete label and a fragment packet.

Randrianasolo et al. 519 has paniculate inflorescences but leaves that, though possibly immature, are crowded and quite small, resembling those of *H. axillare*; it is possibly a hybrid between *H. erianthum* and *H. axillare*. *Service Forestier 9384* has unusually small leaves and short sepals and petals that are subequal but barely and weakly ciliate, and glabrous. It is suggested that this may represent a hybrid involving *H. erianthum* and an unknown second parent, possibly from sect. *Odontolobus* rather than sect. *Blackwellia* proper.

Additional material examined. – **Madagascar. Prov. Antsiranana:** Daraina, forêt de Bekaraoka, aux abords du village d'Andranotsimaty, 13°11'S 49°42'E, 130 m, 7.XI.2001, fl., *Gautier & Ravelonarivo 4095* (MO, P); Ins. Sakatia prope Nosi-be, II.1880, fl., *Hildebrandt 3361* (P); *ibid loco,* II.1880, fr., *Hildebrandt 3361a* (P); Vallée de l'Antsahabe, affluent de la Lokoho, 50–300 m, 10–11.III.1949, fl. & fr., *Humbert 23351* (MO, P [2 sheets]); Montagne d'Ambre (S de Diego), III.1962, fl., *Keraudren 1659* (P); Riv. Ankarakely, Nossibe, XII.1912, fl., *Perrier de la Bâthie 6206* [?] (P); Fkt. Manakana, forêt d'Ambondrobe, 13°42'46"S 50°05'25"W, 18.V.2004, fl., *Rabehevitra et al. 1062* (MO, P); Plateau de Beankany, Ambanja, 12.XII.1963, fl., *Rakotozafy 335* (P); Daraina, forêt d'Ampondrabe, 12°58.33'S 49°42.25'E, 65 m, 13.IV.2004, fl., *Ranirison 651* (MO, P); Ankara JB8, Diego-Suarez, 10.XI.1954, sterile, *Service Forestier 12037* (P); Antanamanino, Vohémar, 18.VI.1956, fr., *Service Forestier 15958* (P); Le long de l'Andrafiamena affluent du haut Rodo, 8.II.1966, fl., *Service Forestier 24548* (MO [2 sheets], P [2 sheets]); Prov. de Diego-Suarez, s.d., fl. & fr., *Ursch 157* (P). **Prov. Mahajanga:** R.N. 8, Soalala, 14.V.1951, fl. & fr., *Réserves Naturelles 3309* (P); Antanimora, Ambolobozo, Analalava, 20.IV.1956, buds, *Service Forestier 15786* (P).

Possible hybrid specimens. – **Madagascar. Prov. Antsiranana:** Imahagaga, Montagne des Français, 12°24'42"S 49°22'22"E, 220 m, 14.II.2005, fl., *S. Randrianasolo et al. 519* (MO); Ankara, Diego-Suarez, 11.III.1954, fl. & fr., *Service Forestier 9384* (P).

7. ***Homalium fortunatii*** Appleq., **spec. nova** (Fig. 2).

Holotypus: Madagascar. Prov. Toamasina: Vatomandry, Ambalabe, along trail to Ambatobe, a deviation from Ambalabe-Sahanionaka trail, 19°18'17"S 48°37'22"E, 302 m, 4.II.2011, fl. & fr., *Randrianasolo et al. 1358* (MO-6703445!; iso-: G!, P!; TAN).

Homalium fortunatii Appleq. differs from H. thuarsianum (Tul.) Baill. in having minutely pubescent young twigs; elliptical to narrowly elliptical (to broadly elliptical or obovate) leaves, (3.4–)7.5–13 × (1.4–)3.5–5.3 cm, with base convex (to rounded) and apex cuspidate with rounded tip (to rounded); and sepals and petals slightly shorter than, to slightly longer than, the calyx tube.

Tree to 12–15 m; young twigs minutely pubescent becoming glabrous. *Leaves* elliptical to narrowly elliptical (broadly elliptical to obovate in abnormally small leaves), (3.4–)7.5–13 × (1.4–)3.5–5.3 cm; petiole 2–6.5 mm; base convex (to rounded), often attenuate at extreme base; apex cuspidate with rounded tip (rounded); margins shallowly repand, with glands small, often slightly protruding; adaxial surface drying dark brown, sometimes gray-tinged, abaxial surface brown. *Inflorescences* paniculate, lateral, sometimes cauliflorous on small twigs, 5–11.5 cm, pubescent; flowers pedicellate with pedicels 0.7–2 mm; bracts lanceolate to ovate, 1.8–3.5 mm (< 1 mm at apex). *Flowers* 7–9-merous; calyx tube funnelform with rounded base, erect-pubescent; sepals ligulate (to narrowly lanceolate) with acute (to rounded) apex, 2.1–2.5 mm; petals ligulate with acute (to rounded-acute) apex, 1.8–2.7 mm; sepals and petals post-flowering pinkish white or reddish, slightly shorter than calyx tube to slightly longer, ascending, ciliate with long soft hairs, abaxial surface sparsely pubescent, adaxial surface sparsely villous; sepal glands pubescent; filaments 0.6–0.7 mm, basally villous; ovary villous; styles 4–5, 0.6–0.8 mm, basally villous.

Etymology. – *Homalium fortunatii* is named for botanist Fortunat Rakotoarivony; he was among the collectors of the type specimen and is a strong advocate of conservation and botanical research in the region of its collection.

Vernacular names and use. – "Hazombatofotsy" *(Randrianasolo et al. 1358);* "Vazanaomby" *(Randrianasolo et al. 1358).*

Wood of *H. fortunatii* is used for construction *(Randrianasolo et al. 1358).*

Distribution, ecology and conservation status. – *Homalium fortunatii* is known from two low-elevation humid forests in Toamasina. Because of its very small known Area of Occupancy (only 8 km^2) its conservation status may be estimated as "Vulnerable" [VU D2].

Notes. – *Homalium fortunatii* is among the *H. thuarsianum* (Tul.) Baill. group of species with paniculate inflorescences and pubescent sepal glands. *Homalium thuarsianum* has glabrous young twigs, usually oblanceolate to obovate (to oblong-oblanceolate or elliptical leaves) with cuneate to convex bases and variable (often rounded, but rarely rounded-cuspidate) apices, and sepals and petals that are consistently longer than the calyx tube when fully developed.

Material of *H. fortunatii* has been misidentified as *H. erianthum*, which likewise has relatively large leaves and paniculate inflorescences. *Homalium erianthum* has glabrous sepal glands and much longer stamens, and is confined to Anstiranana.

Paratypus. – **Madagascar. Prov. Toamasina:** Masoala Peninsula, trail just above Antalavia River on S bank, 1–2 km from coast, 15°45'S 50°02'E, 50–100 m, 19.II.1988, fl. & fr., *Schatz et al. 1928* (MO, P).

8. ***Homalium longiracemosum*** Appleq., **spec. nova** (Fig. 3).

Holotypus: Madagascar. Prov. Toliara: Anosy Rég., Distr. Taolagnaro, Cne Mahatalaky, Fkt. Sainte Luce, forêt littorale d'Analavinaky, située à l'W du village d'Ambandrika au bord de la riv. de Rianabo, 24°43'21"S 47°00'44"E, 143 m, 24.XI.2009, post-fl., *Rakotovao 4714* (MO-6481608!; iso-: TAN).

Homalium longiracemosum Appleq. is distinguished from other Malagasy species of Homalium sect. Blackwellia in having leaves mostly narrowly lanceolate to narrowly elliptical, 7.3–15 × 2.6–3.9 cm with petiole (6.5–)9–18 mm, racemose inflorescences 9–25 cm long, and pubescent sepal glands.

Tree to 18 m, 45 cm dbh; young twigs glabrous. *Leaves* narrowly oblanceolate to narrowly elliptical (obovate-elliptical), 7.3–15 × 2.6–3.9 cm; petiole (6.5–)9–18 mm; base convex to cuneate; apex short-acuminate to cuspidate (acute); margins shallowly repand, undulate or crenate-serrulate, with glands elongated, prominent at tooth apices; adaxial surface drying dark brown, abaxial surface medium brown. *Inflorescences* racemose, lateral, 9–25 cm, short-pubescent; flowers pedicellate with pedicels 0.5–2(–3.5) mm; bracts linear to narrowly oblong, c. 1.5–2 mm. *Flowers* 6-merous; calyx tube funnelform, sparsely short-pubescent to glabrate; sepals narrowly oblanceolate (to narrowly oblong) with acute apex, 1.8–3.8 mm; petals narrowly lanceolate to narrowly oblong with acute apex, 2.5–3.8 mm; sepals and petals yellowish green, accrescent, moderately longer than calyx tube, in fruit ascending (partly

Fig. 2. – *Homalium fortunatii* Appleq. **A.** Flowering branch; **B.** Flowers. [*Randrianasolo et al. 1358*, TAN]
[Drawing: R.L. Andriamiarisoa]

Fig. 3. – *Homalium longiracemosum* Appleq. **A.** Flowering branch; **B.** Flowers. [*Rakotovao 4714*, TAN]
[Drawing: R.L. Andriamiarisoa]

and irregularly reflexed), ciliate with straight well-separated hairs, both surfaces glabrous or glabrate; sepal glands short-pubescent; filaments 1.6–2.5 mm, glabrous; ovary moderately pubescent with thick straight hairs; styles 4, c. 1.6 mm, basally pubescent.

Vernacular name. – "Varikanda" *(Rakotovao 4714).*

Distribution, ecology and conservation status. – The two known collections of *H. longiracemosum* are from a small region in extreme southeastern Madagascar, where they occur in low-altitude humid forest. Though both are indicated in Tropicos (2018) to be from the protected area of Tsitongambarika, the very small Area of Occupancy (8 km²), with two populations in very close proximity, supports a conservation status of "Vulnerable" [VU D2].

Notes. – *Homalium longiracemosum* is distinguished from other species of sect. *Blackwellia* with pubescent sepal glands and racemose inflorescences by its long, narrow, long-petioled leaves and long sturdy racemes.

Both known specimens, which were collected around the same time but from two different localities, evince an unusually high level of insect damage.

Paratypus. – **Madagascar. Prov. Toliara:** Taolagnaro, Mahatalaky, Farafara Vatanibe, forêt humide à haute futaie à l'W du village de Malama, au bord de la grande riv. Belomotse, 24°51'02"S 47°00'20"E, 135 m, 14–18.XI.2009, fl., *Rakotovao et al. 4513* (MO).

9. ***Homalium martialii*** Appleq., **spec. nova** (Fig. 4).

Holotypus: Madagascar. Prov. Antsiranana: Vohemar, Antsirabe Nord, Andravinambo, forêt d'Antsolatra, 14°07'27"S 49°58'10"E, 385 m, 31.I.2014, fl. & fr., *Martial et al. 431* (MO-6634726!; iso-: P!, TAN!).

Homalium martialii Appleq. differs from H. thuarsianum (Tul.) Baill. in having usually elliptical to narrowly elliptical (to obovate) leaves, with often longer petioles and with margins irregularly crenate or shallowly repand (crenate-serrate), and sepals and petals much shorter than calyx tube (seldom only slightly shorter), often somewhat lanceolate.

Tree to 10 m, 13 cm dbh; young twigs glabrous. *Leaves* elliptical (to narrowly elliptical or somewhat obovate), (3–)3.5–7.6(–9) × (1.7–)2–3.3(–3.7) cm; petiole 3–12(–15) mm; base convex or basally attenuate; apex cuspidate with rounded tip to short-acuminate or rounded; margins irregularly crenate or shallowly repand (crenate-serrate), with glands small, elliptical, usually sunk in margins (slightly prominent at tooth apices); adaxial surface drying grayish or dull brown, abaxial surface medium brown. *Inflorescences* few-branched panicles (racemes with some flowers clustered), lateral, 1–3 per node, (4–)5.5–10(–12) cm, short-pubescent; flowers pedicellate with pedicels (0.5–)1.5–2.7(–3.6) mm; bracts lanceolate, 0.8–1.8(–3?), rapidly caducous. *Flowers* (7–)8–9-merous; calyx tube funnelform with rounded base, short-pubescent; sepals narrowly lanceolate (ligulate) with acute apex, 1.4–3 mm; petals narrowly lanceolate (ligulate) with acute apex, 1.3–2.6 mm; sepals and petals greenish-white to grayish or reddish (probably only post-flowering), moderately accrescent, much shorter (to slightly shorter) than calyx tube, ascending (suberect, rarely spreading), ciliate with long soft hairs, abaxial surface short-pubescent, adaxial surface moderately to sparsely pilose; sepal glands moderately long-pubescent; filaments 0.6–1 mm, basally villous; ovary villous to pilose; styles 4–5(–6), 0.6–0.8 mm, basally villous.

Etymology. – *Homalium martialii* is named in honor of Martial, a parataxonomist working in the Makirovana region of northeastern Madagascar, who was the lead collector of three of the four known collections of the species. The species is reported to be visited by bees *(Martial et al. 126, 478).*

Vernacular names and use. – "Jabaorahoditra" *(Martial et al. 431).*

Wood of *H. martialii* is used for construction *(Martial et al. 126, 478).*

Distribution, ecology and conservation status. – *Homalium martialii* is native to low-altitude humid forests in a small portion of eastern Antsiranana fairly near the coast, once at 502 m, on sandy soil. The Area of Occupancy is estimated at 16 km² and the Extent of Occurrence at about 28.1 km². Three of these collections are within the Makirovana-Tsihomanaomby forest, which for the moment has some protection through a community-based conservation agreement facilitated by the Missouri Botanical Garden, and the fourth is near it. Because all populations could be affected by a single event such as a cyclone or large fire, a conservation status of "Vulnerable" [VU D2] is warranted.

Notes. – *Homalium martialii* belongs to the group of three species, including *H. thuarsianum* (Tul.) Baill., that share usually well-developed paniculate inflorescences and pubescent sepal glands, as well as usually pubescent inflorescences and calyx. *Homalium thuarsianum* has mostly oblanceolate to obovate leaves, with petioles to 5(–6) mm, and with margins entire or subentire (to revolute or slightly repand). As in many Malagasy species of sect. *Blackwellia*, its petals and sepals at maturity are longer than the calyx tube and consistently ligulate. *Homalium fortunatii*, native to Toamasina, is distinguished by its large leaves. An unusual feature of *H. martialii* is that the sepals and petals are usually much shorter than the calyx tube and often narrowly lanceolate, which gives the flowers

a distinctive appearance as compared to species with longer, ligulate sepals and petals. *Homalium martialii* also has an unusually large number of styles (as many as 6, which is not seen in any other Malagasy species).

Paratypi. – **Madagascar. Prov. Antsiranana:** Forêt classée entre le village d'Andrangana et la riv. d'Anjombalava, massif de Tsihomanaomby, W d'Ambavala, 14°06'03"S 50°02'52"E, 150 m, 7.V.2000, fr., *Andrianjafy et al. 62* (MO); Sambava, Marogaona, Ambodimanganangaiky, forêt de Makirovana, en haut versant, 14°10'42"S 49°56'03"E, 502 m, 17.IV.2013, fl., *Martial et al. 126* (G, K, MO); Sambava, Anjangoveratra, Ambavala, forêt de Tsihomanaomby, Atsahakasaka, sur crête, 14°06'55"S 50°03'03"E, 110 m, 11.II.2014, fl., *Martial et al. 478* (MO).

10. ***Homalium micranthum*** (Boivin ex Tul.) O. Hoffm., Sert. Pl. Madagasc.: 18. 1881.

≡ *Blackwellia micrantha* Boivin ex Tul. in Ann. Sci. Nat., Bot. ser. 4, 8: 63. 1857.

Lectotypus (first step designated by Sleumer, 1973: 263; second step designated here): **Madagascar. Prov. Antsiranana:** Île Nossi Bé, 9.XII.1840, fr., *Pervillé 389* (P [P04704026]!; isolecto-: K [K000231493, K000231494] images seen, P [P04704030, P04704025]!, TAN [TAN000588] image seen).

Tree to 25 m, 70 cm dbh; bark grayish, platanoid; young twigs glabrous or minutely (to short-)pubescent. *Leaves* elliptical to oblong-elliptical or narrowly oblong (occasionally somewhat obovate to oblanceolate or ovate to lanceolate), (2.4–)3.7–9.5 × 1.3–3.4 cm; petiole (1–)2–5(–6) mm; base convex (rounded, cuneate); apex acuminate (rounded, acute, cuspidate); margins serrulate to crenate-serrulate on apical half, with glands elongated, at or above tooth apex, often producing exudate; adaxial surface drying dark brown to blackish (greenish), abaxial surface brown (olive). *Inflorescences* racemose, lateral, often paired (sometimes very numerous), (1.8–)2.5–10 cm, short-pubescent (in South villous); flowers pedicellate with pedicels (0.2–)0.4–1.6(–2.5) mm; bracts lanceolate to ligulate or ovate, 0.3–1.3(–2) mm. *Flowers* (6)7(8)-merous; calyx tube funnelform with base broadening in fruit, sparsely pubescent (sometimes becoming glabrous); sepals more or less ligulate with acute apex, 1.0–3.8 mm; petals ligulate to spatulate (narrowly elliptical) with acute apex, 1.4–4.4 mm; sepals and petals white to pale or yellowish green, sometimes red-tinged, or pink (probably only in fruit), accrescent, moderately to slightly longer than calyx tube, usually mostly ascending in flower, sometimes fully reflexed in early flower, commonly becoming irregularly spreading to reflexed in fruit, ciliate, both surfaces sparsely pubescent to glabrous; sepal glands pubescent; filaments (0.9–)1.3–2.7 mm, glabrous (sparsely pilose); ovary pubescent; styles 4, 1.4–2.6 mm, pubescent at base.

Vernacular names and use. – "Fotsiakara" (*Service Forestier 16265* [Taisaka dialect]); "Janganito" *(Antilahimena 211, Birkinshaw & Antilahimena 540, Réserves Naturelles 3004, Service Forestier 7718);* "Janganito malandy" *(Madiomanana et al. 279, Service Forestier 3881, 11074, 13108);* "Zanganito" *(Réserves Naturelles 9398);* "Zanganito malandy" *(Service Forestier 11514).*

Wood of *H. micranthum* is used for construction *(Service Forestier 16265).*

Distribution, ecology and conservation status. – *Homalium micranthum* is mostly native to northeastern Madagascar, primarily from Antsiranana; it has been reported on laterite. As presently circumscribed, it includes several specimens from eastern and southeastern Madagascar. As such, it has a large range and has been collected in several protected areas (Lokobe, Montagne d'Ambre, Manombo, Masoala, Manongarivo) so its conservation status must be estimated as "Least Concern" [LC].

Notes. – Most collections of *H. micranthum* are from northeastern Madagascar, almost all from Antsiranana. Several collections outside Antsiranana have previously, or now for the first time, been tentatively identified as having affinities to *H. micranthum*. The geographic range of these specimens is suspiciously broad, but for the most part, though they are all at the extreme of the species' morphological range in at least one or two characters, they are not clearly distinguished from it. Specimens from eastern littoral forests have moderately villous inflorescences, in contrast to the more usual short-pubescent inflorescences. The few specimens from the southeast (Prov. Tulear) are of particular interest: mature leaves are not available for all, but they seem to share an unusual leaf shape (obovate, rounded-cuspidate apex, sometimes cuneate base) and to have the calyx tube normally, rather than rarely, glabrate at maturity. The bark description in the label data of *Service Forestier 16265* from Fianarantsoa is somewhat inconsistent with descriptions from Antsiranana. Since the floral morphology of these specimens is unremarkable, they are not segregated at this time, but the availability of more material in future might allow them to be recognized as distinct.

Among the atypical specimens of *H. micranthum* is *Perrier de la Bâthie 18374*, originally a syntype of *H. viguieri* H. Perrier. This specimen seems to fit better in *H. micranthum* than in *H. viguieri*, primarily due to its long and relatively narrow petals; its relatively large, short-acuminate leaves and mostly short-pedicellate flowers are more typical of *H. micranthum*, though not totally unknown in *H. viguieri*. It has slightly longer bracts than typical of *H. micranthum* and unusual sparsely pilose filaments, but otherwise resembles typical *H. micranthum*. Further investigation of any surviving population in the area would be desirable.

Fig. 4. – *Homalium martialii* Appleq. **A.** Flowering branch; **B.** Flowers. [*Martial et al. 431*, TAN]
[Drawing: R.L. Andriamiarisoa]

Another problematic specimen is *Service Forestier 23946* (P), from coastal Fianarantsoa between Farafangana and Manombo. This collection resembles *H. micranthum* from the same area, with some unexpected characters; in particular, the sepal glands are glabrous. It may be a hybrid involving *H. micranthum* and a species with glabrous glands, most plausibly *H. axillare* (which is not known from that area, but which has a sufficiently wide range that its presence would not be surprising).

The protologue of *Blackwellia micrantha* cited *Pervillé 389* and *Boivin 2125*. The latter collection provided the holotype of the simultaneously published *B. eriantha* Tul. A portion of the material of *Pervillé 389* at P was wrongly marked in the herbarium with a Boivin label and "2125". The real *Boivin 2125* is very different in appearance, as *Homalium micranthum* and *H. erianthum* are not at all confusable. It may be presumed that Tulasne intended to quote label data, including the misused number, and did not intend to include the real *Boivin 2125* in *Blackwellia micrantha*. Therefore, *Pervillé 389* constitutes the only original material. Sleumer (1973) stated that the "holotype" was "Pervillé Herb. 389 in Herb. Boivin 2125" at P, with an isotype at K. This would constitute an effective first-step lectotypification, but there are actually three probable duplicates of *Pervillé 389* at P, from which one still needs to be selected as lectotype.

The sheet chosen here, [P04704026], is preferred because it is the largest fragment and also the least susceptible to confusion, since it is marked only with a printed "Pervillé 1841" label and a handwritten "No. 389". The second sheet, [P04704030], bears a printed "Boivin 1847–1852" label and hand-marked "no. 2125", as well as handwritten labeling that says "Pervillé leg. et ... comm, sub n. 389" and also "2125. Nossi-bé. Bernier comm. 1846" [i.e., before the date of Boivin's voyage]. The third sheet, [P04704025], bears only the Boivin label and herbarium number, with a fragment packet marked "Blackwellia micrantha Tul."; it is *Homalium micranthum* and can be presumed to be unlabeled material of *Pervillé 389*.

Selected material examined. – **Madagascar. Prov. Antsiranana:** Nosy-Be, RNI Lokobe, 13°24'30"S 48°18'15"E, 0–50 m, 7.XII.1994, fl. & fr., *Antilahimena 211* (MO, P); Nossi-be, env. d'Ambatozandry, 50–250 m, 14.XII.1967, fr., *Bernardi 11867* (P); Réserve Naturelle Intégrale No. 6, Lokobe, 5 km SE of Hell Ville, 13°25'S 48°18'E, 100 m, 28.XI.1992, fl., *Birkinshaw 193* (MO, P); Ramena valley, fkt. Antsahabe, 13°49'30"S 48°46'59"E, 500 m, 10.X.1998, fl., *Birkinshaw & Antilahimena 540* (MO, P); Ambahatra cours supérieur, 13°59'S 48°26'E, crête entre les deux bras de l'Ambahatra, 24.V.2000, fr., *Gautier & Rakotomamonjy 3649* (MO, P); Nosi-be, IX.1879, fr., *Hildebrandt 3178* (P [2 sheets]); Ampasindava, forêt d'Andranomatavy, 13°39'42"S 47°58'41"E, 615 m, 30.XI.2009, fr., *Madiomanana et al. 279* (P); Parc National de Montagne d'Ambre, 12°32'S 49°11'E, 990–1100 m, 16–20.XI.1992, fl., *Malcomber et al. 1805* (MO, P); Daraina, forêt d'Antsahabe, 13°12'53"S 49°33'19"E, 796 m, 14.I.2004, fr., *Nusbaumer 961* (MO, P); vallée du Sambirano, I.1909, fl., *Perrier de la Bâthie 4591* (P); H[aut]e Mananjeba, 300 m, IV.1913, fl., *Perrier de la Bâthie 6702* (P); Daraina, forêt de Binara, 13°14.06'S 49°37.31'E, 300 m, 31.III.2004, fl. & fr., *Ranirison 552* (MO, P); Marotongoza, Nossi-Bé, 12.III.1957, fr., *Réserves Naturelles 9398* (P); Ambodimangatelo, Ambanja, 12.X.1951, fr., *Service Forestier 3880* (P); Ambaliha, Ambanha, 18.X.1953, fr., *Service Forestier 7718* (P); Maromiandra, Ambanja, 6.X.1954, fl., *Service Forestier 11074* (MO [2 sheets], P); massif de l'Antsatrotro (Manongarivo), 900 m, XI.1954, fl., *Service Forestier 11514* (P [2 sheets]); Bekolosy, Ambanja, 17.XI.1954, fl., *Service Forestier 13108* (P); massif de la Montagne d'Ambre, rive droite de la riv. des Makis entre la Station des Roussettes et la grande cascade, 18–20.XI.1958, fr., *Service Forestier 20039* (MO, P); Prov. de Diego-Suarez, s.d., fr., *Ursch 205* (P). **Prov. Fianarantsoa:** Distr. Farafangana, c^{ton} Ihorombé, Manombo, 31.V.1956, fr., *Service Forestier 16265* (P). **Prov. Toamasina:** Ambatovola, Vohitra, 700 m, I.1928, fl. & fr., *Perrier de la Bâthie 18374* (P); [Masoala] Peninsula, trail just above Antalavia River on S bank, 1–2 km from coast, 15°45'S 50°02'E, 50–100 m, 19.II.1988, fl. & fr., *Schatz et al. 1922* (MO, P). **Prov. Toliara:** Fort-Dauphin, s.d., fl., *Cloisel 188* (MO, P); près de la riv. Antorendrika avant Belavenona, 24°52'S 47°07'E, 0–20 m, 22.III.1989, fl., *Rabevohitra 1773* (MO, P); Fkt. Ambandrika, Analavinaky S8, 24°46'29"S 47°08'57"E, s.d., fl. & fr., *Randriatafika & Rabenantoandro 412* (MO, P).

11. ***Homalium myrtifolium*** Sleumer in Bull. Jard. Bot. Natl. Belg. 43: 258. 1973.

Holotypus: Madagascar. Prov. Toamasina: Vavatenina, Fénérive-Est, 20.I.1957, fl., *Réserves Naturelles 8879* (P [P00375094]!; iso-: P [P04679966]!; L image seen, TAN image seen).

Tree or *shrub* to 9 m; young twigs minutely pubescent when very young, soon becoming glabrous. *Leaves* obovate, 0.9–2.5(–3) × 0.4–1.1(–1.5) cm; petiole (0–)0.5–2.5 mm; base cuneate to convex; apex rounded; margins few-toothed near apex to subentire, with glands small, rounded, sunk in margins at tooth apices; adaxial surface drying pale brown, abaxial surface greenish; secondary veins strongly ascending, at a narrow angle to midrib. *Inflorescences* racemose, lateral, 1.4–5 cm, short erect-pubescent; flowers pedicellate with pedicels 0.5–2 mm (subsessile); bracts linear to lanceolate, 0.5–1 mm. *Flowers* 6-merous; calyx tube funnelform to subcylindrical with rounded base, pubescent; sepals ligulate to narrowly oblanceolate with acute apex, 1.4–2.6 mm; petals spatulate or ligulate to narrowly lanceolate with acute apex, 1.7–3 mm; sepals and petals greenish to yellowish white to partly pink or red (perhaps only post-anthesis), modestly accrescent, usually much longer than calyx tube (especially in fruit), ascending or partly spreading, seldom becoming reflexed, ciliate, adaxial surface sparsely pubescent, abaxial surface sometimes bearing few long hairs; sepal glands long-pubescent, often rather sparsely; filaments 1.6–2.5 mm, sparsely pilose; ovary pilose to hispid (becoming glabrate); styles 3(4), 1.3–1.7 mm, basally pilose.

Vernacular name. – "Hazombato" (*Réserves Naturelles 8879*).

Distribution, ecology and conservation status. – *Homalium myrtifolium* is native to low- to mid-altitude humid forests in Toamasina and Toliara. Only three distinct locations have been documented. All collections from Toliara come from the area of Tsitongambarika, which is protected, and the species

has been collected once near, though not within, Zahamena National Park. The third population, from an unprotected area, has not been recollected since 1957. Though the Area of Occupancy is estimated at only 16 km^2, the Extent of Occurrence is estimated at c. 12,600 km^2. However, much of the intervening habitat is unsuitable due to ongoing anthropogenic damage. Although the fact that the only apparently thriving population is protected argues against a conservation status of Endangered, the species should be considered "Near Threatened" [NT] based on its limited range and the uncertain status of one of the formerly existing populations.

Notes. – *Homalium myrtifolium* is easily recognized by its small, pale-drying obovate leaves with entire or minutely toothed margins and few, ascending secondary veins. It is the only species that has secondary veins ascending at a narrow angle to the midrib; it is among the group with racemose inflorescences and pubescent sepal glands.

Most collections come from a single small region in southeastern Toliara; two collections come from Toamasina, well to the north. The morphology of those collections is not significantly different from that of the southern collections.

Additional material examined. – **Madagascar. Prov. Toamasina:** A l'W du village d'Ambatoaranana, NE de la RNI de Zahamena, 17°33'30"S 48°53'20"E, 900 m, 24.I.1994, fr., *Randrianjanaka & Be Maxime 52* (MO, P). **Prov. Toliara:** Fkt. Antsotso, forêt d'Ivohibe, 24°34'15"S 47°12'36"E, 44 m, 29.I.2015, fl., *Randriatsivery et al. 580* (G, MO); Antsotso Avaratra, 24°33'54"S 47°11'55"E, 432 m, 11.XII.2007, fl., *Razakamalala et al. 3882* (MO, P [2 sheets]); Antsotso Avaratra, forêt Tsitongambarika, 24°34'16"S 47°12'05"E, 271 m, 1.IV.2008, fl., *Razakamalala et al. 4108* (MO, P); Fkt. Antsotso, forêt d'Ivohibe, 24°33'51"S 47°12'20"E, 395 m, 28.I.2015, fl., *Razanatsima et al. 1385* (G, MO); forêt de Bemangidy, au N de Mahatalaky, Fort-Dauphin, 1–2.II.1963, fl., *Service Forestier 22339* (P); Bemangidy Forest, 24°34'15"S 47°12'36"E, 150 m, 13.IV.2010, *Thulin & Razafindraibe 11855* (MO).

12. ***Homalium perrieri*** Sleumer in Bull. Jard. Bot. Natl. Belg. 43: 257. 1973.

≡ *Homalium buxifolium* H. Perrier in Mém. Mus. Natl. Hist. Nat. 13: 286. 1940 [nom. illeg.] [non Däniker, 1933].

Holotypus: Madagascar. Prov. Antsiranana: Massif de Manongarivo, versant de Sambirano, 500 m, V.1909, fl., *Perrier de la Bâthie 4620* (P [P04734362]!; iso-: L [L0010989] image seen).

Tree to 14 m, 20 cm dbh, or large shrub; young twigs minutely pubescent. *Leaves* elliptical to broadly elliptical (somewhat ovate or obovate, suborbicular), 0.5–2.3 × 0.3–1.4 cm; petiole 1–1.5(–2) mm; base rounded to convex; apex acute with rounded tip; margins crenate-serrate, with glands elongated in tooth apices, often producing exudate; adaxial surface drying dark brown, abaxial surface brown; domatia occasionally present in axils of secondary veins. *Inflorescences* racemose, lateral, few-flowered, (0.8–)1.4–3(–3.8) cm, minutely to short-pubescent; flowers pedicellate with pedicels 0.5–1.4(–2.5) mm; bracts 0.4–0.8 mm. *Flowers* 6–7-merous; calyx tube funnelform with base broadening in fruit, sparsely long-pubescent (to sparsely pilose); sepals ligulate (narrowly elliptical) with acute apex, 1–2(–3.1) mm; petals ligulate (narrowly spatulate to narrowly oblanceolate-elliptical) with acute apex, 1.3–2.1(–3.3) mm; sepals and petals pale yellow (to pale beige, white, reddish white), probably moderately accrescent, from substantially longer than calyx tube (especially in fruit) to equal in length, ascending (partly spreading to reflexed), long-ciliate, abaxial surface sparsely long-pubescent (to sparsely pilose), adaxial surface sparsely pilose to glabrate; sepal glands pilose; filaments 1–2.6 mm, sparsely pilose (moderately pilose, glabrous); ovary pilose; styles 4, 1.2–2.5 mm, basally pilose.

Vernacular names. – "Beando" (*Bernard et al. 72*); "Hazombato" (*Rakotomalaza 10*); "Maroankoditra" (*Schatz & Antilahimena 4019*).

Distribution, ecology and conservation status. – *Homalium perrieri* is native mostly to mid-elevation humid forest (to low-elevation or moderately high-elevation) in Antsiranana and northern Toamasina. It has been reported to occur on basalt and near water. There are at least six distinct populations, and the range includes the protected areas of Manongarivo and Anjanaharibe Sud, so its conservation status is tentatively estimated as "Least Concern" [LC].

Notes. – *Homalium perrieri* is among the species with racemose inflorescences and pubescent sepal glands. It is most similar to *H. viguieri* H. Perrier, which has usually sessile flowers with broad sepals and petals, and *H. micranthum,* which has usually much larger leaves and usually larger inflorescences. Leaves of pressed specimens of *H. perrieri* often appear almost distichously arranged. It is easily distinguished from the other very small-leaved species in this group, *H. myrtifolium*, which has obovate pale-drying leaves with cuneate bases, strongly ascending secondary veins, and small marginal glands that do not produce noticeable exudate.

Ravelonarivo & Rabesonina 646, from a very high altitude in Antsiranana, is a particularly problematic specimen. It has much larger leaves (to 3.3 × 1.7 cm) than other specimens, whose leaves are always less than 2.4 cm long, sometimes much less; the sepals and petals are usually reflexed shortly after anthesis. The leaves appear distichous and the inflorescences are very short, like *H. perrieri*; hence identifying this as a small-leaved *H. micranthum* is not satisfactory. It might be suspected of being a distinct locally endemic taxon, but there is not enough material available to describe it. Further collections from the area would be desirable.

Homalium perrieri was a replacement name for *H. buxifolium* H. Perrier [nom. illeg.]. As far as is known, there was initially only one duplicate of the type collection, which is the holotype. The "isotype" at L, like most cited type duplicates at L., consists of a few leaves plainly borrowed after the fact from a complete specimen housed elsewhere, and does not have equal standing.

Additional material examined. – **Madagascar. Prov. Antsiranana:** Antalaha, Ambohitralalana (Cap-Est), forêt Tanandavehely, 15°18'S 50°29'E, 0–15 m, 9.XII.1994, fl., *Bernard et al. 72* (G, MO, P); E of Ankaramy, Réserve Spéciale of Manongarivo, Bekolosy, 14°02'S 48°19'E, 800–1100 m, 7–12.XII.1992, fl. & fr., *Malcomber et al. 1984* (MO, P); E of Ankaramy, Réserve Spéciale de Manongarivo, Antsatrotro, 14°05'S 48°23'E, 600–900 m, 26–30.III.1993, fl. & fr., *Malcomber et al. 2326* (MO, P); E of Ankaramy Be, Manongarivo Réserve Spéciale, Bekolosy, 14°02'S 48°18'E, 1000–1200 m, 4.XII.1993, fl. & fr., *Malcomber & Rakotomalala 2616* (MO, P); E de Ankaramy-be, Réserve Spéciale de Manongarivo, Bekolosy, 14°04'S 48°17'E, 1000–1480 m, IV.1993, fl., *Rakotomalaza 10* (MO, P); Andravinambo, forêt de Tsihomanaomby, 14°06'S 50°00E, 23.I.2014, fl., *Rakotonirina et al. 413* (MO); Réserve Spéciale Anjanaharibe-Sud, village de Mandritasrahely, 14°43'10"S 49°27'12"E, 1700 m, 14.II.1995, fl., *Ravelonarivo & Rabesonina 646* (G, MO, P); Réserve Spéciale #5, Manongarivo, W slopes of Antsatrotro, 14°08'S 48°21'E, 800 m, 23–25. III.1991, fl. & fr., *Schatz 3216* (MO, P). **Prov. Toamasina:** Maroantsetra, fkt. Anjiahely, forest Ankahaminivola, 15°23'57"S 49°26'08"E, 780 m, 15.XII.2002, fl. & fr., *Antilahimena et al. 1490* (MO, P); Ankirindro massif, slopes above village Ambodivato, 15°19'13"S 49°33'29"E, 150 m, 20.XI.2002, fl., *Schatz & Antilahimena 4019* (G, K, MO, P); bassin de la Fananehana, massif de l'Androrona, crête terminale, 850 m, II.1954, *Service Forestier 9001bis* (P).

13. ***Homalium retivenium*** Sleumer in Bull. Jard. Bot. Natl. Belg. 43: 264. 1973.

Holotypus: Madagascar. Prov. Toamasina: Env. de Navana (à l'E de Maroantsetra), I.1954, fl. & fr., *Service Forestier 8884* (P [P00375174]!; iso-: L [L0011003] image seen, P [P04734404, P04734406]!, TEF [TEF000233] image seen).

Tree to 16 m, 12 cm dbh; latex white; young twigs glabrous. *Leaves* obovate to elliptical, oblanceolate or narrowly elliptical, 2.8–7.5 × 1.3–3.8 cm; petiole 1–3.5 mm; base cuneate to convex; apex rounded-acute to short-acuminate (rounded, cuspidate); margins entire or subentire, usually revolute, with glands absent or inconspicuous; adaxial surface drying grayish (blackish brown), abaxial surface brown to olive. *Inflorescences* racemose, lateral, often paired, 1.8–6.8(–10) cm, moderately pilose; flowers pedicellate with pedicels 1–2.4(–4.5) mm, apparently early caducous; bracts linear to lanceolate, (0.7–)1–1.8 mm. *Flowers* (7–)8–9-merous; calyx tube short or narrowly funnelform with narrow base, sparsely (to moderately) pilose; sepals linear to narrowly ligulate (narrowly spatulate) with acute apex, 2.5–5.5(–6.4) mm; petals linear to narrowly ligulate with acute apex, 2.5–5.5(–6.8) mm; sepals and petals greenish-white to yellowish, strongly accrescent, much longer than calyx tube, ascending (sometimes becoming spreading, seldom to reflexed), long-ciliate, both surfaces sparsely pilose; sepal glands moderately pilose on apex; filaments 2–3 mm, moderately pilose; ovary sparsely pilose; styles 3–4, (1.6–)2.5–3.4 mm, basally pilose.

Vernacular names. – "Hazombato à p[etits] f[euilles]" *(Service Forestier 15758);* "Hazombatofotsy" *(Service Forestier 2791, 15694);* "Marankoditra" *(Réserves Naturelles 6193);* "Tsilaitra" *(Raharimalala 219).*

Distribution, ecology and conservation status. – *Homalium retivenium* is native to low-elevation and littoral forests in northeastern Madagascar. There are more than five distinct localities, and the species occurs in several protected areas, including Betampona, Masoala, Nosy Mangabe, and Tampolo. Therefore, a preliminary assessment of its conservation status is "Least Concern" [LC].

Notes. – Among eastern species of sect. *Blackwellia* with racemose inflorescences and pubescent sepal glands, *H. retivenium* is notable for its pilose inflorescences and flowers and its relatively numerous, long, narrow sepals and petals, much exceeding the calyx tube (which at anthesis is rather short and narrow).

The only specimen included in *H. retivenium* from the province of Antsiranana, *Service Forestier 2791,* is morphologically atypical with very long inflorescences and pedicels and unusually broad sepals and petals. Further investigation of this population would be desirable.

Additional material examined. – **Madagascar. Prov. Antsiranana:** Ampavatonampingotra, Andapa, 12.II.1951, fr., *Service Forestier 2791* (P). **Prov. Toamasina:** Maroantsetra, fkt. Ambanizana, 15°37'00"S 49°57'00"E, 10.IV.2002, fl., *Antilahimena & Aridy 962* (MO, P); Betampona RNI, fkt. Andratambe, 17°55'S 49°13'E, 250–650 m, I-X.2000, fl., *Iambana et al. 268* (G, MO); Forêt d'Ibanda, 2.II.1990, fl., *Raharimalala 219* (P); RN I [Betampona], Ambodiriana, Tamatave, 12.II.1954, fr., *Réserves Naturelles 6193* (MO, P); Masoala Peninsula c. 6 km NNE of Ambanizana along trail from Ambanizana River to summit of Ambohitsitondroina, 24–25.XII.1989, fl., *Schatz & Modeste 2910* (MO, P); Nosy Mangabe in the Bay of Antongil, 15°30'S 49°46'E, 0–330 m, 2–19.I.1990, fl., *Schatz & Carlson 2926* (MO, P); Masoala Peninsula, along coast at third major river, approx. 6 km S of Ambanizana, 0–10 m, 26.XII.1990, fl., *Schatz & Modeste 3092* (MO, P); Tampolo, Fénérive, 14.II.1956, fl. & fr., *Service Forestier 15694* (MO, P [2 sheets]); Vohilengo, Fénérive-Est, 20.II.1956, fl. & fr., *Service Forestier 15758* (P).

14. ***Homalium thuarsianum*** (Tul.) Baill., in Bull. Mens. Soc. Linn Paris 1: 574. 1886 [as *thouarsianum*].

≡ *Blackwellia thuarsiana* Tul. in Ann. Sci. Nat., Bot. ser. 4, 8: 60–61. 1857.

Holotypus: Madagascar: *sine loco,* s.d., fl., *du Petit-Thouars s.n.* (P [P04679701]!; iso-: L [L0011030] image seen).

Tree to 20 m, 41 cm dbh; young twigs glabrous. *Leaves* oblanceolate to obovate (oblong-oblanceolate, elliptical), (2.8–)3.5–7.8(–10) × (1.2–)1.6–3.8(–5.2) cm; petiole (0–)2–5(–6) mm; base cuneate to convex; apex rounded to somewhat obtuse or acute with rounded apex (shallowly emarginate, rounded-cuspidate); margins entire or subentire, sometimes revolute, occasionally slightly repand, with glands absent or few and sunk in margins; adaxial surface drying grayish to dark (greenish) brown, abaxial surface brown. *Inflorescences* paniculate usually with well-developed branches, lateral (pseudoterminal), (4–)6.7–17(–20) cm, moderately to densely pubescent with fine white, usually erect hairs, to short-pilose; flowers pedicellate with pedicels 1–2.7 mm; bracts ovate to broadly elliptical (linear), (0.8–)1.5–2.5 (seldom foliose, to 22 mm). *Flowers* 7–9-merous; calyx tube subcylindrical with rounded base, pubescent with erect white hairs to pilose; sepals ligulate with acute apex, 1.5–4.2 mm; petals ligulate with acute apex, 1.6–4.5 mm; sepals and petals variable in color, greenish-white to yellowish, cream or beige, pink to red or purple probably in fruit, accrescent, longer than calyx tube, almost always ascending (some flowers spreading at anthesis, apparently returning to ascending in fruit), ciliate with hairs very long near apex, abaxial surface appressed-pubescent (rarely sparsely pilose), adaxial surface sparsely pilose; sepal glands sparsely pilose to sparsely pubescent; filaments 0.8–1.7 mm, pilose; ovary sparsely to moderately pilose; styles (4)5, (0.6–)0.8–1.3 mm, pilose at base.

Vernacular names and uses. – "Hazobato" *(Service Forestier 2875);* "Hazombato" *(Lehavana & Zackarie 711, Noyes et al. 960, Rabevohitra et al. 4370, 4610, 4864, 4970, Réserves Naturelles 10340, Service Forestier 4603, 5861, 8314, 9525, 15701, 19526);* "Hazombato à g[randes] f[euilles]" *(Service Forestier 15701);* "Hazombato à p[etites] f[euilles]" *(Service Forestier 15172);* "Hazombato-mena à p[etites] f[euilles]" *(Service Forestier 15702);* "Hazondrano-fotsy" *(Service Forestier 15704);* "Marakoditra" *(Service Forestier 14228);* "Tsitakonala" *(Service Forestier 4153).*

Wood of *H. thuarsianum* is used for construction *(Service Forestier 19526).*

Distribution, ecology and conservation status. – *Homalium thuarsianum* is native to littoral and sublittoral forests along the eastern coast of Madagascar; it is reported on sand. One specimen *(Antilahimena & Felix 7756)* was collected at 1053 m altitude, geographically relatively close to the species' range but far outside its normal altitude range; this specimen cannot be excluded from the species by morphology. Though the habitat is fragmented and highly threatened, this species is relatively widely distributed and occurs in the protected areas of Tampolo, Soanierana-Ivongo, Nosy Mangabe, and Masoala. Therefore its conservation status is estimated as "Least Concern" [LC].

Notes. – *Homalium thuarsianum* is the most widespread and common of three species with pubescent sepal glands and usually well-developed paniculate inflorescences, the other two being the newly described *H. fortunatii* and *H. martialii*. All three share other features in common, including often relatively large bracts, 7–9-merous flowers, and sepals and petals that are usually pubescent on the abaxial surface (in *H. thuarsianum*, occasionally sparsely pilose) but somewhat pilose to villous on the adaxial surface. They are all native to low-altitude eastern humid forests. This author considers it reasonable to presume that they are a natural group. The distinctions between *H. thuarsianum* and the other two species of this group are described under those species.

Flowers are visited by bees *(Lehavana et al. 54, Ludovic & Rakotoarivony 241).*

Selected material examined. – **Madagascar. Prov. Fianarantsoa:** Fkt. Ambahy, forêt d'Andohan'I Martin, 20°48'07"S 48°28'56"E, 22 m, 13.XI.2003, fl., *Rabehevitra et al. 749* (MO, P); Fkt. Ambahy, 20°46'15"S 48°28'48"E, 21.III.2003, fl., *Rabevohitra et al. 4610* (MO, P); Entre Vohipeno et la mer, VII.1954, fl., *Service Forestier 9221* (P); Ankijy, Vatomasina, Vohipeno, 13.IX.1956, fl., *Service Forestier 14228* (P); Ankazondratana, Nosy Varika, 30.V.1958, fl., *Service Forestier 19526* (P [2 sheets]). **Prov. Toamasina:** Brickaville, fkt. Ambodilendemy, Ankerana, 18°24'58"S 48°47'21"E, 1053 m, 23.III.2011, fl., *Antilahimena & Felix 7756* (MO, P); Mananara, 28.IX.1920, fl. & fr., *Decary 63* (P); Ambila-Lemaitso, 18°49'S 49°09'E, 2–5 m, 15.XI.1989, fl. & fr., *Keating & Miller 2261* (MO, P); Tampolo, 17°17'16"S 49°24'30"E, 16 m, 14.IV.2004, fl. & fr., *Lehavana et al. 54* (MO, P); Fkt. Tanambao Ambodimanga, près du gite, 16°47'S 49°43'E, 27.V.2010, fr., *Lehavana & Zackarie 711* (MO); Île Sainte-Marie, Lokintsy, forêt d'Ambohidena on NE coast, 16°51'11"S 49°57'10"E, 10 m, 13.V.2003, fr., *McPherson et al. 18913* (MO, P); 9.4 km W of Mahavelona village (Foulpointe), 17°38'S 49°30'E, 10 m, 28.II.1992, *Noyes et al. 960* (MO); Fkt. Ambohidena, forêt d'Ambohidena, 16°51'05"S 49°57'13"E, 10 m, 10.X.2003, fl., *Rabehevitra et al. 654* (MO, P); Cne rurale Manompana, Forêt Antanambao-Ambodimanga, 16°45'40"S 49°42'35"E, 1.II.2003, fl., *Rabevohitra et al. 4370* (MO, P); Andranokoditra, Ankanin'ny nofy, forêt de Vohibola, 18°35'42"S 49°14'02"E, 10.II.2003, fl., *Rabevohitra et al. 4413* (MO, P); Soanierana-Ivongo, Andrangazaha, 16°52'02"S 49°40'52"E, 29.1.2004, fl., *Rabevohitra & Rakotomamonjy 4864* (MO, P); Forêt au NW de Tanambao, 16°45'12"S 49°42'56"E, 31.I.2004, fr., *Rabevohitra et al. 4970* (MO, P); Fkt. Ambohidena, forêt d'Ambohidena, 16°51'11"S 49°57'18"E, 18.II.2004, fl., *Rabevohitra et al. 5016* (MO, P); Tampini, X.1924, fl. & fr., *Réserves Naturelles (Dumazer) s.n.* (P); RN II [Masoala], Ambohitralalana, district Antalaha, 16.II.1954, fr., *Réserves Naturelles 6620* (P); Soanierana-Ivongo, 18.V.1959, fl. & fr., *Réserves Naturelles 10340* (P); Nosy Mangabe RS 4–5 km S of Maroantsetra, 15°30'S 49°46'E, 0–330 m, 21.II.1992, fr., *Schatz et al. 3243* (MO, P); Gare d'Ambila-Lemaitso, 28.VIII.1951, fl. & fr., *Service Forestier 4153* (P); Antetezana, Tamatave, 28.XII.1951, fl. & fr., *Service Forestier 4603* (P); Ambila-Lemaitso, 10.X.1953, fl., *Service Forestier 5861* (P); S de Tenina, S de Rantabe, IV.1954, fl. & fr., *Service Forestier 9168* (MO, P); Tampolo, Fénérive, 29.VIII.1955, fl., *Service Forestier 15172* (MO, P); Tampolo, Fénérive, 22.II.1956, fl., *Service Forestier 15701* (MO, P); Île Sainte-Marie, forêt d'Ampaniny, 17.V.1969, fr., *Service Forestier 28858* (P [2 sheets]).

15. ***Homalium viguieri*** H. Perrier in Mém. Mus. Natl. Hist. Nat. 13: 287. 1940.

Lectotypus (designated by Sleumer, 1973: 253): **Madagascar. Prov. Toamasina:** Prov. d'Andovoranto, district de Moramanga, berges du Mangoro près d'Ankarefo, 800 m, 10.XI.1912, fr., *Viguier & Humbert 1188* (P [P04679649]!). **Syntypi: Madagascar:** *sine loco,* s.d., fr., *Humblot 609* (P [P04679644]!; K [K000231503] image seen, S [S10-10215] image seen, US [US00603579] image seen). **Prov. Toamasina:** Ambatovola, Vohitra, 700 m, I.1928, fl. & fr., *Perrier de la Bâthie 18374* (P [P04679643]!).

Shrub to 4 m or small tree, sometimes lianescent; young twigs minutely pubescent. *Leaves* broadly elliptical to elliptical (obovate to broadly obovate, rarely to broadly ovate or suborbicular), 2–5.6 × 1.1–3.8 cm; petiole 1.5–3(–4) mm; base convex to rounded or cuneate; apex rounded to acute or obtuse (short-acuminate); margins serrulate, with glands usually elongated, forming teeth apices, rarely small and imbedded in margin; adaxial surface drying dark grey to blackish, abaxial surface brown. *Inflorescences* racemose, lateral, 1.3–6.1(–7.5) cm, pubescent; flowers normally sessile (short-pedicellate); bracts linear to lanceolate or spatulate, 0.8–1.2(–1.5) mm, often persistent. *Flowers* 6(7)-merous; calyx tube broadly funnelform with rounded base, sparsely pubescent to glabrate; sepals lanceolate-oblong to oblong or obovate with acute (cuspidate, rounded) apex, (0.7–)1.1–1.9 mm; petals oblong-elliptical to obovate, oblong or spatulate with acute (cuspidate, rounded) apex, (1–)1.3–2.4 mm; sepals and petals white to greenish (purplish) white, little accrescent, about as long as calyx tube, soon spreading, usually reflexed after flowering, ciliate with widely spaced hairs especially in fruit, both surfaces sparsely pubescent to glabrate; sepal glands short-pubescent; filaments 1.7–3 mm, glabrous; ovary sparsely to moderately pubescent, sometimes becoming glabrate; styles (3)4, 1.7–3 mm, glabrate with few trichomes near base.

Vernacular names. – "Fanazava" *(Réserves Naturelles 6891);* "Hazondromifehy" *(Réserves Naturelles 8704);* "Lalona fotsy" *(Réserves Naturelles 2807);* "Maroankoditra" *(Service Forestier 5718);* "Marokoditra" *(Service Forestier 3292);* "Voafotsy" *(Cours 289).*

Distribution, ecology and conservation status. – *Homalium viguieri* is native to mid-elevation humid forests to 1100 m; it does not occur in the extreme north or southeast. This species appears to be uncommon, as the number of collections is small compared to some other species with equally wide distributions and the number of recent collections particularly small. The Extent of Occurrence is estimated as c. 66,400 km² and the Area of Occupancy as 56 km². It was collected several times in or around the protected area of Zahamena (= Perinet, Ambatondrazaka) but most of the habitat is unprotected, has suffered damage since the existing collections were made, and is at threat of further damage. Because over 10 distinct locations have been documented, this species would not meet the criteria for a conservation status of "Vulnerable", but a status of "Near Threatened" [NT] might be appropriate.

Notes. – *Homalium viguieri* has pubescent sepal glands and racemose inflorescences; it is most similar to *H. micranthum* and the small-leaved *H. perrieri*. It is distinguished from similar species by its broad sepals and petals, which are spreading to reflexed shortly after anthesis, and usually sessile flowers. The inside of the ovary locule may be glabrous or sparsely pubescent. In these characters it seems to be the species of *Homalium* sect. *Blackwellia* that is most similar to the species of *Homalium* sect. *Odontolobus.*

One of the syntypes of *H. viguieri* enumerated above, *Perrier de la Bâthie 18374*, is herein doubtfully placed in *H. micranthum.* "*Homalium viguieri* var. *cuneiforme* H. Perrier", based on *Cours 289* (Perrier de la Bâthie, 1946), was not validly published because of the absence of a required Latin diagnosis. It was later sunk into *H. viguieri* (Sleumer, 1973). It does not appear to represent a distinct infraspecific taxon.

Additional material examined. – **Madagascar. Prov. Antananarivo:** La Mandraka, VIII.1906, fl., *Alleizette 1018* (P); Betsitra, près Analabe (N Imerina), X.1906, fr., *Alleizette 1276* (P). **Prov. Fianarantsoa:** Vangaindrano, vallée de l'Itomampy, 700 m, VI.1914, fr., *Perrier de la Bâthie 12660* (P); Manakara, s.d., fr., *Service Forestier 2749* (P); P.K. 92, route Farafangana à Vohipena, 3.IV.1951, fr., *Service Forestier 3681* (P); Andriodriotra, Antsindra, Ambohimanga Sud, 20.VII.1952, fr., *Service Forestier 6381* (P). **Prov. Toamasina:** Andapanomby, Makira forest, Ampandisanana river, 15°21'04"S 49°06'53"E, 1007 m, 26.IV.2007, fl. & fr., *Birkinshaw et al. 1666* (G, MO); Manakambahiny, 1100 m, III.1938, fr., *Cours 289* (P); Mahanoro, riv. Andohasira, Ampasimpotsy, 19°53'54"S 48°47'27"E, 5 m, 22.VI.2010, fr., *Rakotonirina 535* (MO, P); R.N. III, Manaka Est, Ambatondrazaka, 8.III.1951, fr., *Réserves Naturelles 2807* (P); Menalamba, Perinet, 21.III.1951, fl., *Réserves Naturelles 3292* (P); Manaka-Est, Ambatondrazaka, 6.II.1954, fr., *Réserves Naturelles 6891* (P); *ibid loco,* 30.III.1954, fr., *Réserves Naturelles 6896* (P); *ibid loco,* 12.III.1956, fl., *Réserves Naturelles 8704* (P [2 sheets]); Antsahatsaka, Beravina, Perinet, 7.IX.1952, fr., *Service Forestier 5718* (P); berges du Mangoro au N d'Ambodimanga, 21.I.1968, fl., *Service Forestier 28127* (P [2 sheets]).

Excluded name

Homalium microphyllum O. Hoffm., Sert. Pl. Madagasc.: 18. 1881.

This species was described from a single collection (*Hildebrandt 3329* from Vavatobé [probably = Ambavatoby, Antsiranana]), which has many duplicates; no similar material has been collected since. Though the collected material seems to be well into flower, the sepals and petals are small and often spreading, apparently scarcely accrescent, and the ovary is not strongly conical. In these characters, it resembles the species

transferred to *Homalium* sect. *Odontolobus*. However, it also has characters more consistent with *Homalium* sect. *Blackwellia* sensu stricto; it appears that there is usually only one bract per flower, the calyx tube is cylindrical and well-developed, the upper surface of the ovary is not particularly broad, and the styles are much longer than in most species of *Homalium* sect. *Odontolobus*. It is suggested that the collected individual was an intersectional hybrid that is not known to persist and does not merit taxonomic recognition.

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Appendix

Index to collectors. Collections are listed alphabetically by first collector's last name, with determinations indicated by numbers corresponding to those of species in the taxonomic treatment; types are indicated in boldface.

Alleizette 1018 (15), *1276* (15); *Ammann 426* (4); *Andriamihajarivo 409* (2a); *Andrianjafy 62* (9), *527* (2b); *Antilahimena 211* (10), *841* (4), *962* (13), *1490* (12), *3060* (2a), *3158* (2a), *3217* (2a), *4343* (2a), *4452* (2a), *7756* (14), *8794* (2a), *8802* (2a), *8838* (2a)

Bernard 72 (12), *725* (2a), *782* (2a), *795* (2a); *Bernardi 11867* (10), *11948* (10); *Birkinshaw 193* (10), *540* (10), *767* (2b), *1666* (15); *Boivin 2125* (**6**); *Bojer s.n.* (2a); *Bosser 196* (2b)

Callmander 711 (2b), *717* (2b); *Cloisel 180* (2b), *199* (**2b**), *212* (2b); *Commerson s.n.* (**2a**), *s.n.* (6); *Cours 298* (15), *1898* (2b), *2801* (2b)

Decary 63 (14), *1278* (10), *4776* (5), *10863* (2b), *10864* (2b), *10912* (2b); *Dorr 3978* (2b), *4000* (2b); *Dumetz 1080* (2b)

Gautier 2563 (2b), *3120* (2b), *3649* (10), *4095* (6); *Gereau 3260* (2b)

Herb. Jard. Bot. 3997 (15), *4306D* (15); *Hildebrandt 3178* (10), *3329* (unidentified hybrid), *3361* (6), *3361a* (6); *Hong-Wa 21* (2b), *319* (4); *Humbert 12626* (2b), *20373* (1), *23351* (6), *24146* (2b), *24304* (2b), *24915* (2b), *25617* (4); *Humblot 582* (2b), *609* (15)

Iambana 268 (13)

Keating 2261 (14); *Keraudren 1659* (6)

Lehavana 54 (14), *57* (14), *711* (14); *Louvel 63* (2a); *Ludovic 241* (14)

Madiomanana 279 (10); *Malcomber 1805* (10), *1984* (12), *2326* (12), *2616* (12), *2856* (2a); *Manjato 489* (2b); *Martial 126*

(9), *431* (**9**), *478* (9); *McPherson 14361* (2b), *16356* (2b), *16379* (2b), *16381* (2b), *18913* (14); *Messmer 679* (2a)

Noyes 960 (14); *Nusbaumer 961* (10), *1636* (2b)

Perrier de la Bâthie 2199 (**4**), *2325* (4), *4591* (10), *4620* (**12**), *6206* (6), *6702* (10), *6794* (2a), *12660* (15), *18374* (10?); *Perrillé 389* (**10**); *Petit-Thouars s.n.* (**14**); *Phillipson 5689* (2b), *6069B* (2a)

Rabehevitra 654 (14), *749* (14), *1062* (6); *Rabenantoandro 1558* (2b); *Rabevohitra 2117* (2b), *2387* (2b), *2418* (2b), *2442* (2b), *4370* (14), *4413* (14), *4610* (14), *4864* (14), *4970* (14), *5016* (14); *Raharimalala 219* (13); *Rakotomalaza 10* (12); *Rakotonandrasana 608* (2a); *Rakotonirina 413* (12), *535* (15); *Rakotovao 4402* (2b), *4513* (8), *4517* (1), *4714* (**8**), *6490* (4); *Rakotozafy 335* (6); *Ramananjanahary 781* (2b); *Ramison 110* (2b), *111* (2b), *410* (2b); *Ranaivojaona 1053* (2a), *1153* (2a); *Randriamampionona 659* (1), *682* (**1**); *Randriambololona 121* (2b); *Randrianarivony 651* (2b); *Randrianasolo 519* (6 × 2?), *1358* (**7**); *Randrianjanaka 52* (11); *Randriatafika 263* (2b), *408* (2b), *715* (2b); *Randriatsivery 580* (11); *Ranirison 552* (10), *562* (4), *651* (6), *972* (2b); *Rasoavimbahoaka 413* (4); *Rasoazanany 537* (2a), *554* (2a), *579* (2a); *Ratovoson 1661* (2b); *Ravelonarivo 646* (12), *2793* (2b), *3381* (2b); *Razafindraibe 15* (2a); *Razafitsalama 1117* (2b), *1177* (2b); *Razakamalala 2440* (2b), *3882* (11), *4108* (11), *4774* (1); *Razanatsima 1385* (11); *Razanatsoa 9* (2a), *20* (2a), *45* (2a), *234* (2a); *Réserves Naturelles s.n. [Dumazer]* (14), *1350* (2b), *1812* (2b), *2098* (1), *2272* (2b), *2303* (2b), *2401* (2b), *2807* (15), *3004* (10), *3292* (15), *3309* (6), *3483* (2b), *6193* (13), *6620* (14), *6733* (1), *6891* (15), *6896* (15), *8421* (4), *8611* (4), *8704* (15), *8879* (**11**), *8936* (2b), *9253* (2b), *9398* (10), *10340* (14), *10716* (2b)

Schatz 1928 (7), *2910* (13), *2926* (13), *3092* (13), *3216* (12), *3243* (14), *4019* (12); *Scott Elliot 3041* (2b); *Service de Colonisation 42* (2a); *Service Forestier 753* (2b), *835* (2b), *994* (2b), *1047* (2a), *1391* (2a), *1603* (2a), *2533* (2a), *2749* (15), *2791* (13), *2875* (14), *2960* (4), *3073* (4), *3681* (15), *3880* (10), *3881* (10), *4153* (14), *4603* (14), *4841* (2a), *5718* (15), *5861* (14), *6085* (2b), *6381* (15), *6396* (2b), *6440* (2b), *6628* (2a), *7415* (2b), *7551* (2a), *7718* (10), *7785* (4), *8314* (14), *8884* (**13**), *9001bis* (12), *9168* (14), *9221* (14), *9384* (6 × ?), *9525* (14), *9979* (2b), *11074* (10), *11419* (10), *11514* (10), *11526* (2a), *11969* (2a), *12037* (6), *13108* (10), *13711* (2b), *14228* (14), *14394* (2a), *15172* (14), *15694* (13), *15701* (14), *15702* (14), *15704* (14), *15758* (13), *15786* (6), *15958* (6), *19526* (14), *20039* (10), *22339* (11), *22924* (2a), *23946* (10 × ?), *24548* (6), *26282* (2a), *26398* (2b), *28127* (15), *28506* (2b), *28623* (2b), *28858* (14), *28936* (3), *28953* (**3**)

Thouvenot 42 (2a); *Thulin 11855* (11)

Ursch 62 (2a), *72* (2a), *157* (6), *205* (10)

van der Werff 13533 (2b); *Viguier* 1188 (**15**)

Wohlhauser 319 (2b), *60273* (4)