A taxonomic revision of Melanoxerus (Rubiaceae), with descriptions of three new species of trees from Madagascar

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Abstract

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This paper provides a taxonomic revision of Melanoxerus Kainul. & Bremer (Rubiaceae) – a genus of deciduous trees with eye-catching flowers and fruits that is endemic to Madagascar. Descriptions of three new species, Melanoxerus antsirananensis Kainul., Melanoxerus atropurpureus Kainul., and Melanoxerus maritimus Kainul. are presented along with distribution maps and a species identification key. The species distributions generally reflect the ecoregions of Madagascar, with Melanoxerus antsirananensis being found in the dry deciduous forests of the north; Melanoxerus atropurpureus in the inland dry deciduous forests of the west; Melanoxerus maritimus in dry deciduous forest on coastal sands; and Melanoxerus suavissimus (Homolle ex Cavaco) Kainul. & B. Bremer in the dry spiny thicket and succulent woodlands of the southwest.

Résumé

KAINULAINEN, K. (2021). Révision taxonomique du genre Melanoxerus (Rubiaceae), avec la description de trois nouvelles espèces d’arbres de Madagascar. Candollea 76: 105–116. En anglais, résumés anglais et français. DOI: http://dx.doi.org/10.15553/c2021v761a11

Cet article propose une révision taxonomique de Melanoxerus Kainul. & Bremer (Rubiaceae), un genre d’arbres à feuilles caduques avec des fleurs et des fruits attrayants qui est endémique de Madagascar. La description de trois nouvelles espèces, Melanoxerus antsirananensis Kainul., Melanoxerus atropurpureus Kainul. et Melanoxerus maritimus Kainul. est présentée accompagnée de cartes de répartition et d’une clé d’identification des espèces. La répartition des espèces reflète généralement les écorégions de Madagascar: Melanoxerus antsirananensis pousse dans les forêts sèches de feuillus du nord; Melanoxerus atropurpureus dans les forêts de feuillus sèches de l’intérieur des terres de l’ouest; Melanoxerus maritimus dans la forêt sèche décidue sur sables côtiers; et Melanoxerus suavissimus (Homolle ex Cavaco) Kainul. & B. Bremer dans le fourré épineux sec et les forêts succulentes du sud-ouest.

Keywords

RUBIACEAE – Gardenieae – Euclinia – Melanoxerus – Madagascar – Taxonomy – New species
Introduction

The genus Melanoxerus Kainul. & B. Bremer is part of the tribe Gardenieae in the flowering plant family Rubiaceae. It was segregated from Euclinia Salisb. based on the results of the molecular phylogenetic analyses by Kainulainen & Bremer (2014). Whereas Euclinia is restricted to central Africa, Melanoxerus is endemic to Madagascar, where it is widely distributed in the subarid to dry southern and western regions but also occurs in the dry to subhumid north. Melanoxerus is a genus of deciduous or semi-deciduous trees with smooth flaky bark and sympodial plagiotropic branches with terminally clustered leaves and scarious stipules covering the terminal buds. The flowers are showy and very fragrant, and the large fleshy fruits are lenticellate with conspicuous patterns. The genus can be further diagnosed in that leaves and flowers turn black when drying. It is readily distinct from the other genera of tribe Gardenieae in Madagascar, i.e., Catunaregam Wolf, Gardenia Ellis, and Hyperacanthus E. Mey. ex Bridson. Melanoxerus lacks the opposite-decussate spines of Catunaregam, the sheathing persistent stipules and resinous exudate of Gardenia, and the flowers and fruits are terminal, whereas in Hyperacanthus these appear axillary (Schatz, 2001; Madagascar Catalogue, 2021).

A taxonomic revision of Melanoxerus is warranted. Melanoxerus suavissimus (Homolle ex Cavaco) Kainul. & B. Bremer is currently the only recognized species in the genus. It was originally described by Cavaco (1967) as Gardenia suavissima Homolle ex Cavaco, but shortly thereafter transferred to Euclinia by Leroy (1974). In the protologue, Cavaco (1967) lists several paratypes from western Madagascar that do not correspond to the same species as the holotype from Ambovombe in southernmost Madagascar. The populations from northern Madagascar are also morphologically distinct. Since plants of Melanoxerus are deciduous and often flower before the leaves flush, specimens collected at different times of the year can be difficult to match up, and this may in part explain how the new species presented in this paper have escaped taxonomic attention in the past despite their eye-catching flowers and fruits. In this study I recognize a total number of four species in Madagascar, with M. antsiranensis Kainul., M. atropurpureus Kainul., and M. maritimus Kainul. being newly described.

The molecular phylogenetic study by Kainulainen & Bremer (2014) included samples from three of the four species recognized here, and their phylogenetic reconstruction from plastid DNA data indicates that Melanoxerus atropurpureus (as “sp. 2”) and M. suavissimus are more closely related than either are to M. antsiranensis (as “sp. 1”). Melanoxerus maritimus was not included in that study. Kainulainen et al. (2017) estimated that the Melanoxerus clade diverged from an African ancestor around 9.4 Ma (with a 95 % highest posterior density interval of 6.6–12.4 Ma), and that the crown age, and consequently the minimum age of the dispersal of this lineage from Africa to Madagascar, is 4.2 Ma (95 % HPD: 1.9–6.9 Ma).

Taxonomic treatment

Melanoxerus Kainul. & B. Bremer in Taxon 63: 828. 2014.

Typus: Melanoxerus suavissimus (Homolle ex Cavaco) Kainul. & B. Bremer (= Gardenia suavissima Homolle ex Cavaco. = Euclinia suavissima (Homolle ex Cavaco) J.-F. Leroy).

Deciduous or semi-deciduous shrubs or trees up to 26 m tall. Sympodial plagiotropic branching, usually with much reduced distal shoot internodes, terminally clustered leaves, and scarious stipules covering the terminal buds. Leaves opposite, petiolate, glossy, papyraceous to subcoriaceous, cordiform to obovate, drying dark brown to black. Stipules triangular, caducous. Flowers bisexual. Inflorescences terminal, with few or solitary flowers. Calyxes shortly tubular, lobes narrowly triangular, caducous. Corollas funnelform or campanulate to broadly urceolate; lobes contorted in bud, overlapping to the left, spreading horizontally at anthesis. Styles club-shaped, ribbed, with secondary pollen presentation in the distal end. Pollen dispersed in tetrads. Fruits fleshy-indehiscent, globose to ovoid, with a thick mesocarp and an exocarp covered with conspicuous lenticels. Seeds flattened, irregularly angled, horizontally inserted and immersed in soft pulp.

Distribution, habitat and ecology. – Melanoxerus is endemic to Madagascar and distributed across most of the southern and western regions (i.e. Anosy, Androy, Atsimo-Andrefana, Menabe, Melaky, Boeny, and Sofia Regions), as well as in northernmost Madagascar in the DIANA and SAVA Regions. Melanoxerus occurs in vegetation types ranging from subarid thickets to subhumid semi-deciduous forests, from sea level to about 800 m in elevation, and on various substrates from coastal sands to laterite, including skeletal soils in karstic limestone formations (tsingy). It is absent from the Central Highlands and the humid east coast. Although there are exceptions, in general the species distributions reflect the ecoregions of Madagascar (cf. Olson et al., 2001), with M. antsiranensis being found in the dry deciduous forests of the north; M. atropurpureus in the inland dry deciduous forests of the west; M. maritimus in dry deciduous forest on coastal sands; and M. suavissimus in the dry spiny thicket and succulent woodlands of the southwest (Fig. 1).

Little is known about the ecology of this genus, and no information on pollination or seed dispersal has been recorded for the specimens that I have examined. The flowers are large and ± fleshy, with funnelform to broadly urceolate corollas that are externally white (sometimes tinged purple or pale green)
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and internally purple or white with green, red, or purple markings. Pollen is usually deposited on the upper part of the style (secondary pollen presentation), which is club-shaped with longitudinal ridges. The flowers are strongly fragrant with a sweet smell like jasmine.

The fruits are large, indehiscent “berries” with a fleshy pulp and are most likely an adaptation to endozoochory. The seeds are presumably dispersed by lems, but it is possible that seed dispersal, at least in part, has relied on the recently extinct Malagasy megafauna, as has been suggested for *Adansonia* L. (Baum, 1995) – a genus which also has large indehiscent fruits, and a distribution in Madagascar that is similar to that of *Melanoxerus*. The leaves of *Melanoxerus* appear to be attractive to herbivores because in the specimens seen in this study the leaves are usually damaged. Although not documented, insects are probably responsible for part of the damages, although slugs (pers. obs.) and lemurs of the genus *Propithecus* (information on the label of *Myers & Boltz 110*) have been observed feeding on leaves of *M. antsirananensis*.

### Key to the species of Melanoxerus

1. Leaves broadly lanceolate to obovate; flowers solitary or not; corolla tube campanulate to broadly urceolate; corolla throat glabrous; mature fruits with lenticels 1–2.5 mm in diam. .......................................................... 2
   1a. Leaves cordiform or ovate to lanceolate; flowers solitary; corolla tube funnel-shaped; corolla throat pubescent; mature fruits with lenticels 0.1–1 mm in diam. ........................................... 3
   1b. Leaves generally obovate, 7–18 × 4.5–8.5 cm; corolla throat white or red, purple or violet (and sometimes also green) spots ............................................. 2. *M. antsirananensis*
   1c. Leaves broadly obovate, 10–30 × 6.5–14.5 cm; corolla throat uniformly purple to violet ... 2. *M. atropurpureus*
   1d. Leaves broadly ovate to cordiform; leaf length/width ratio 4:3 to 1:1; corolla lobes rounded to indented .......................................................... 3. *M. maritimus*
   1e. Leaves ovate to lanceolate; leaf length/width ratio 3:1 to 3:2; corolla lobes acute ..................... 4. *M. suavissimus*

### Taxonomy

1. **Melanoxerus antsirananensis** Kainul., sp. nov. (Fig. 2).

   – *Euclinia* sp. 1 in Kainulainen & Bremer (2014: 820).

   **Holotypus:** MADAGASCAR. Reg. DIANA [Prov. Antsiranana]: Distri. Ambilobe, Mahamasina, Réserve Spéciale d’Ankanara, 12°57’15”S 49°07’39”E, 100 m, 10.II.2003, fr., Bardot–Vaucoulon et al. 1406 (P [P00455719]; iso-: K [K000551041], MOI, TAN).

   *Melanoxerus* antsirananensis Kainul. differs from *M. suavissimus* (Homolle ex Cavaco) Kainul. & B. Bremer by its pauciflorous inflorescences (vs. solitary flowers), campanulate (vs. funnel-form) corollas, and obovate (vs. ovate to lanceolate) leaves. It most resembles *M. atropurpureus* Kainul., from which it differs in that the corolla throat is white with purple and sometimes green spots (vs. uniformly purple), and in its smaller (7–18 × 4.5–8.5 cm vs. 10–30 × 6.5–14.5 cm) and obovate (vs. broadly lanceolate) leaves.

   **Shrubs or trees** up to 18 m tall and 40 cm dbh. Bark beige or whitish pale grey and smooth. Stipules 9–14.5 × 4–7 mm, triangular, interpetiolar, caducous. Leaves deciduous, petioles 0.7–6 cm long, adaxially canaliculate; leaf blades papyraceous, obovate, 7–18 × 4.5–8.5 cm; bases cuneate to attenuate, apices (rounded) obtuse or shortly acuminate; adaxial surface: dark green when fresh, drying dark brown to black, smooth and glossy, glabrous; 8–12 pairs of conspicuous, ± pinnate secondary veins, tertiary venation reticulate; midribs prominent, whitish green when fresh, ± the same colour as the leaf when dry; abaxial surface green when fresh, drying dark brown to blackish, glabrous except for tuft domatia that are often present in the vein axils. Flowers solitary or few (< 10) in a terminal, sessile, congested and umbel-like inflorescence; pedicels up to 30 mm long; hypanthium narrowly urceolate, 5–8 × 3–4 mm, glabrous. *Calyxes* green; calyx tubes 0.5–2 mm long, externally and internally glabrous; calyx lobes 4.3–11 × 0.8–3.5 mm, narrowly triangular, spreading or recurved. *Corollas* fleshy, campanulate; corolla tubes 1.5–2.6 cm long, externally (yellowish) white, sometimes with purple and pale green streaks, glabrous, internally white with red, purple or violet (and sometimes also pale green) spots, glabrous or with a few trichomes (0.1–0.5 mm long) at the very base; corolla lobes white (sometimes with purple spots on the external side), 1–4.5 × 0.8–2.5 cm, ovate to deltate, rounded to acute, spreading horizontally at anthesis; stamina subsessile (filaments c. 2 mm long), attached 10–12 mm below corolla sinus and 3 mm from anther base; anthers 11–18 × 1.5–2 mm, linear, included or shortly exerted (to 2 mm above corolla sinus). *Styles* simple, clavate, with shallow longitudinal grooves, 14–20 mm long, glabrous, included or shortly exerted; stigma shortly bifid (lobes 0.5–3.5 mm long). *Fruits* (globose) ellipsoid, 3–7.6 × 2.7–6 cm, smooth, glabrous, olive to brown, with numerous beige to pale grey lenticels (1–2 mm in diam.), fleshy-indehiscent with yellowish to white pulp; calyx tube sometimes persistent but calyx lobes caducous. *Seeds* flattened, irregularly angled, 10–15 mm in diam., c. 2 mm thick, smooth, ± translucent, yellowish brown when fresh, drying black.

**Vernacular names.** – “Mamoampoma” (*Rakotondrafaraka et al.* 505); “Mantalana” (*Service Forestier 8329*); “Voavandrikala” (*Manjakahery & Sola 83*).
Distribution, habitat and ecology. — Melanoxerus antsirananensis is only known from the DIANA and SAVA Regions in Antsiranana Province where it is widely distributed (Fig. 1). The new species grows in littoral forests and in dry deciduous forests from sea level to c. 700 m in elevation on Montagne d’Ambre.

Phenology. — Flowering material has been collected from September to December and fruiting material from September to July.

Conservation status. — Melanoxerus antsirananensis is known from numerous localities in northern Madagascar. Its distribution includes five protected areas, i.e. Ankarami, Manampandray, Montagne d’Ambre, and Montagne des Français.

Notes. — The specimen Razafitsalam & Ludovic 16 is unusual in having distinctly velutinous leaves and is tentatively included here. The label on Meyers & Boltz 110 reports that the lemur Propithecus tattersalli eats the young leaves of this species. Melanoxerus antsirananensis flowers at the same time or just before the new leaves flush. It resembles M. atropurpureus in having pauciflorous inflorescences and flowers with campanulate corollas. However, the phylogenetic analysis of Kainulainen & Bremer (2014) indicates that they are not sister species, a result that suggests that these shared characters may be plesiomorphic rather than synapomorphic.

Melanoxerus antsirananensis is distinguished from M. atropurpureus in its smaller leaves (7–18 × 4.5–8.5 cm vs. 10–30 × 6.5–14.5 cm) that are obovate rather than broadly lanceolate. Furthermore, the corolla throat is white with red to violet spots (vs. uniformly dark purple in M. atropurpureus).

Selected additional material examined. — MADAGASCAR. Reg. DIANA [Prov. Antsiranana]; Masorolava, Mahagaga, Antsoroby forest, 12°43′37″S 48°58′11″E, 53 m, 27.IX.2007, fr., Andriambijavavy et al. 1434 (MO, P); Ankarami SR, 2 km W of Mahamasina village, 12°57′36″S 49°06′26″E, 533 m, 5.II.2001, fr., Andriametiana & Bezara 935 (BR, G, K, MO), Andrafana forest near Anjahankely, 12°54′23″S 49°19′30″E, 450 m, 6.I.2011, fr., Bariovalo ZB 176 (G, K); Ankaranina, 12°50′47″S 49°06′18″E, 75 m, 5.II.2011, fr., De Bloc et al. 1226 (BR, MO, P, TAN, UPS).

Distribution of Melanoxerus antsirananensis is only known from numerous localities in northern Madagascar. Its flowering material has been collected from September to December and fruiting material from September to July.

Conservation status. — Melanoxerus antsirananensis is therefore assigned a preliminary conservation status of “Least Concern” [LC] according to the IUCN Red list Categories and Criteria (IUCN, 2012).
Fig. 2. – Melanoxerus antsiranensis Kainul. A. Habit; B. Fruit and smooth bark of a trunk (c. 20 cm dbh); C. Fruiting branch; D–F. Flowering branch with young leaves; G. Immature fruits; H. Cross-section of a fruit showing the seeds embedded in whitish pulp.

[A–B, H: Bremer et al. 5113; C, G: Ramandimbimanana & Randimbirison SDR 372; D–E: Ratovoson 1332; F: Randrianaivo 1433]

[Photos: A–B, H: K. Kainulainen; C, G: S.D. Ramandimbimanana; D–E: F. Ratovoson; F: R. Randrianaivo]
2. Melanoxerus atropurpureus Kainul., sp. nov. (Fig. 3).
   – Euclinia sp. 2 in Kainulainen & Bremer (2014: 820).

Holotypus: MADAGASCAR. Reg. Melaky [Prov. Mahajanga]: Distr. Maintirano, Beanka, partie S, Sarodrano, 18°03′27″S 44°30′50″E, 359 m, 26.XI.2011, fl., Gautier, Tabinarivony & Bolliger 5744 (G [G00340493]); – iso−: BR!, K [K000918390]!, MO!, PI, TEF).

Melanoxerus atropurpureus Kainul. is similar to M. antsinanensis Kainul. in its pauciflorous inflorescences and flowers with campanulate corollas, but it differs in having larger leaves (10–30 × 6.5–14.5 cm vs. 7–18 × 4.5–8.5 cm) that are broadly lanceolate (vs. obovate), and by the uniformly purple corolla throat (vs. whitish corolla throat with red, purple or violet and sometimes also green spots).

Shrubs or trees up to 26 m tall and 25 cm dbh. Bark grey and smooth, flaky. Stipules 2.5–15 × 3–5 mm, triangular, interpetiolar, caducous. Leaves deciduous, petioles 2–7.5 cm long, adaxially canaliculate; leaf blades papyraceous, broadly lanceolate, 10–30 × 6.5–14.5 cm; bases cuneate to rounded, sometimes oblique; apices acute to acuminate; adaxial surface dark green when fresh, drying dark brown to black, smooth and glossy, sparselypubescent along venation; 8–12 pairs of conspicuous, ± pinnate secondary veins, tertiary venation reticulate; midrib prominent, pale green when fresh, ± the same colour as the leaf when dry; abaxial surface pale green when fresh, drying brown to blackish, glabrous except the pubescent veins (trichomes 0.4–1 mm) in the lowermost (c. 0.5 cm) part of the tube. Corollas lobes white, 1.5–3 × 1.2–2.5 cm, ovate, rounded to acute, spreading horizontally at anthesis; stamens subsessile (filaments 1–4 mm long), attached 25–35 mm below corolla sinus and 4–7 mm from anther base; anthers 22–27 × 2–3 mm, linear, included (tips 5–6 mm below corolla sinus). Styles simple, clavate, with shallow longitudinal grooves, 28–33 mm long, glabrous, included; stigma shortly bifid (lobes 1–1.5 mm long). Fruits (globose) ellipsoid, 3.5–7 × 3–6 cm, smooth, glabrous, olive to brown or maroon with numerous beige to pale grey lenticels (1–2 mm in diam.), fleshy-indehiscent with yellowish to white pulp; calyx tube sometimes persistent, but lobes caducous. Seeds flattened, irregularly angled, 8–13 mm in diam., ± 2 mm thick, smooth, ± translucent, pale yellow when fresh, drying black.

Etymology. – The specific epithet atropurpureus refers to the dark purple colour of the interior of the corolla tube in this species.

Vernacular names. – “Andrivitsy” (Réserves Naturelles 7791); “Hazondanitra” (Service Forestier 4953); “Voafotaka” (Labat & Deroin 2280); “Voangorandimbo” (Service Forestier 29775).

Distribution, habitat and ecology. – Melanoxerus atropurpureus occurs in the Boeny, Melaky, and Sofia Regions (Mahajanga Province) and in the southernmost part of the DIANA Region (Antsiranana Province) (Fig. 1), where it grows in dry to humid, deciduous or evergreen forests from sea level to 450 m in elevation.

Phenology. – Flowering material has been collected from October to November and fruiting material from December to July.

Conservation status. – Melanoxerus atropurpureus has a wide distribution in western Madagascar and is known from several protected areas including Ankarafantsika, Bemaraha, and Namoroka. It can therefore be assigned a preliminary conservation status of “Least Concern” [LC] according the IUCN Red List Categories and Criteria (IUCN, 2012). However, it is not a commonly collected species, and more information is needed about its population size.

Notes. – The specimen Perrier de la Bâthie 1155A from the Ankara plateau is in poor shape but probably belongs to this species. In this species the exocarp of the fruit is often almost completely hidden by lenticels (Fig. 3F).

Melanoxerus atropurpureus is the tallest growing species in the genus. It mostly resembles M. antsinanensis but has larger leaves (10–30 × 6.5–14.5 cm vs. 7–18 × 4.5–8.5 cm) that are broadly lanceolate rather than obovate. Furthermore, the
Fig. 3. — Melanoxerus atropurpureus Kainul. A–D. Corolla; E. Cross-section of a fruit showing the seeds embedded in whitish pulp; F. Fruiting branch. [A–D: Gautier et al. LG 5744; E: Hanitrarivo et al. HRM 146] [Photos: A–D: L. Gautier; E: M. Hanitrarivo; F: L. Rajaovelona, Ankarafantsika (Boeny), 17.III.2020]
Corolla throat is uniformly dark purple (white with red to violet spots in *M. antistranamensis*).

*Melanoxerus maritimus* Kainul., sp. nov. (Fig. 4).

**Holotypos:** MADAGASCAR. Reg. Melaky [Prov. Mahajanga]: Distri. Macha, Ampianalina, Andranamaty forest, 13°40'39"S 44°31'37"E, 319 m, 16.IV.2011, fl., Antsalova, 20.III.1993, fr., (G, K); 18°02'55"S 44°31'13"E, 446 m, 11.XII.2011, fl., Nusbaumer et al. LN 3073 3.XII.1992, fr., Labat & Deroin 2280

**Phenology.** – Flowering material has been collected from June to November, and fruiting material from July to February.

**Conservation status.** – *Melanoxerus maritimus* is known from less than ten locations, (three of which are within the recently protected areas of Antrema, Bombetoka Belem-boka, and Mandrozo), with an estimated area of occupancy (AOO) of less than 2000 km². It appears restricted to littoral dry forest. This habitat is impacted for firewood or charcoal production (also noted on label of *De Block & Rakotonasolo*).
Fig. 4. – Melanoxerus maritimus Kainul. A. Habit; B. Flowering branch; C. Flower bud; D–E. Open flowers; F. Transverse section of the corolla and stigma; G–H. Immature fruits. [A–C, F–G: Gautier et al. LG 6196; D: Randriatsivery 207; E: Lobad et al. 3534; H: Labat et al. 3535] [Photos: A–C, F–G: L. Gautier; D: M. Randriatsivery; E, H: J.-N. Labat]
806). It is projected that the number of locations and the number of mature individuals continue to decline, and this species can therefore be assigned a preliminary conservation status of “Vulnerable” [VUB2ab(iii)] according to IUCN Red list Categories and Criteria (IUCN, 2012). However, more information is needed about the population size of this species.

Notes. – *Melanoxerus maritimus* has solitary flowers with a tubular corolla and pubescent corolla throat, and in these characters it most resembles *M. suavissimus*, but it is recognized by its ± cordiform leaves that are almost as wide as long (leaf length/width ratio 4:3–1:1 vs. 3:1–3:2 in *M. suavissimus*), and by having corolla lobes that are rounded to indented rather than acute. The leaves of *M. maritimus* are glossy below and very glossy above. They remain glossy when dried and almost appear varnished. It is notable that none of the specimens examined in this study is lacking leaves, and that specimens collected during the dry season still retain some leaves. This species is therefore probably best considered semi-deciduous as opposed to deciduous.

Selected additional material examined. – **Madagascar. Reg. Boeny [Prov. Mahajanga]:** [Dist. Mahajanga I] Antananamasadza [probably Antanamasaja, now part of Mahajanga town], 1912, *Africanus* 266 (P, S); Katsey, c. 10 m, 19.II.1950, ster., *Bertrand* 16 (P); Dist. Mahajanga II, Antsanitia, Belamonty now part of Mahajanga town], 1912, *Africanus* 266 (P, S); Katsey, c. 10 m, 19.II.1950, ster., *Bertrand* 16 (P).

**Distribution, habitat and ecology.** – *Melanoxerus suavissimus* is widespread in subarid vegetation in the Androy, Anosy, Atsimo–Andrefana, and Menabe Regions (Toliara Province), and occurs as far north as the Manambolo river in the southernmost part of the Melaky Region (Mahajanga Province) (Fig. 1). It is found from sea level to c. 800 m in elevation.

**Phenology.** – Flowering specimens have been collected in (April) July to December, and fruiting specimens throughout the year.

**Conservation status.** – *Melanoxerus suavissimus* is widespread in south-western Madagascar and has been assigned an IUCN conservation status of “Least Concern” [LC] (IUCN, 2021).
Notes. – Since Cavaco’s (1967) original description of *Melanoxerus suavissimus* (as *Gardenia suavissima*) included specimens of both *M. atropurpureus* and *M. maritimus*, an amended description is provided. This is the most widespread and the most commonly collected species. However, few collections have been made in from May to August (none from June), and presumably this species is usually leafless during that time. *Melanoxerus suavissimus* usually flowers at the same time or just before the new leaves flush (cf. Fig. 5A, D). Apparently, the juice of the fruits turns black and is used for making tattoos (Schatz, 2001). Information about of the use of *Melanoxerus* by local people is otherwise scant, although according to the label information on the specimen Ranaivojaona et al. 248, the fruits are edible.

Selected additional material examined. – Madagascar. Reg. Androy [Prov. Toliara]: Besakoa, 24°36'36"S 45°27'59"E, 227 m, 4.III.2003, fr., Andriamahay 497 (K); Imanombo, XI.1952, fr., Bosser 3787 (P), Beraketa, X.1956, fl., Bosser 10237 (P), Ambomalbe, XII.1959, fl. & fr., Bosser 13353 (P, TAN); Beraketa, on road to Isosa, 10 km S of Isosa, 646 m, 19.XII.2004, fr., Rakotomoaso et al. RNF 932 (K, TAN); Antanimora, 30.VII.1926, fr., Decary 4556 (P); Behara, 22.X.1954, fl., Réserve Naturelle 6762 (P), Ampandrandavi, 700–800 m, X.1942, fl., Seyrig 122 (P); Beloha, 19.II.1949, fr., Service Forêster 454 (P, TEF); Imanombo-Ihotaka (rte), 26.IX.1952, fr., Service Forêster 5797 (P, TEF). Reg. Anosy [Prov. Toliara]: Distr. Amboasary Sud, Marotsiraka,
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A. (1967). Un nouveau Gardenia (Rubiacées) de Madagascar. Candollea 26: 55. [http://www.tropicos.org/Project/Madagascar]

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