



A revision of *Scleria* (Cyperaceae) in Madagascar

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Key words

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Madagascar
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Abstract A taxonomic revision of the genus *Scleria* (Cyperoideae, Cyperaceae) in Madagascar is presented. Herbarium specimens have been examined and 422 identified to species level. Our results recognise 25 species of *Scleria* from Madagascar, plus an additional heterotypic variety. Eight species are endemic to Madagascar, two are near endemic, eight taxa are also found on mainland Africa, and eight are widespread tropical taxa. *Scleria achenii* is reported from Madagascar for the first time, and *S. rosea* is accepted at species level instead of being considered as a synonym of *S. trialata*. Distribution maps, conservation assessments, and notes on synonymy, ecology and ethnobotany are provided. Forty-seven names are typified. Three rare endemic species: *S. andringitrensis*, *S. madagascariensis* and *S. perpusilla*, are assessed as threatened; and a recently described species, *S. ankaratrensis*, is indicated as Data Deficient. The most species-rich infrageneric taxa, sections *Hypoporum*, *Abortivae* and *Foveolidia* include 18 taxa in total, and showed strong differences in habitat preference.

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INTRODUCTION

Cyperaceae or the sedge family includes c. 90 genera and 5500 species of annual and perennial herbs (Govaerts et al. 2019). It is a cosmopolitan plant family, which has its centre of generic diversity in the tropics. However, sedges play a fundamental role in the ecology of seasonal and permanent wetlands at all latitudes. *Scleria* P.J.Bergius (1765: 142), also known as nut rushes or razor grasses, is the sixth largest genus in the family with 258 species (Govaerts et al. 2019), it is monophyletic (Bauters et al. 2016), and the only genus of tribe *Sclerieae* (subfamily Cyperoideae) (Franklin Hennessy 1985, Muasya et al. 1998, Hirahara et al. 2007, Simpson et al. 2007, Hinchliff & Roalson 2013, Jung & Choi 2013, Bauters et al. 2016, Semmouri et al. 2019). Although most species of *Scleria* occur in tropical Africa, South America and Asia, 35 species are found in North America (Govaerts et al. 2019). A recent study showed that *Scleria* can be divided into four monophyletic subgenera (*Scleria* subg. *Browniae* (C.B.Clarke) C.B.Clarke, *S.* subg. *Hypoporum* (Nees) C.B.Clarke, *S.* subg. *Scleria* and *S.* subg. *Trachylomia* (Nees) Bauters) (Bauters et al. 2016).

Scleria encompasses herbs with variable habits, from tiny annuals with fibrous roots to perennial climbers more than ten metres long. Perennial habit is achieved by means of a stoloniferous rhizome or tubers, and certain species develop aerial adventitious roots at stem nodes as an adaptation to flooded habitats (Jacono 2008). Culms are trigonous or triquetrous. Leaves are alternate and tristichously arranged, often persistent at the base, and finely serrate at least along the distal third of the margins, rarely smooth. In certain groups, leaves are abruptly narrowed down or pseudopraemorse (Bauters et al. 2016).

Sheaths are sometimes winged, and usually topped by a contraligule (Haines & Lye 1983), opposite to the blade. Inflorescences develop distally and are usually subtended by leafy bracts (Robinson 1966). Flowers are always unisexual and enclosed by at least three glumes (Haines & Lye 1983). Glumes are spirally arranged in staminate spikelets, and distichous in pistillate spikelets (Ahumada & Vegetti 2009). Flowers group in spikelets, where the pistillate flower is always proximal. There are four types of spikelets in *Scleria* (Eiten 1976, Ahumada & Vegetti 2009): unisexual, i.e., pistillate or staminate; androgynous; and subandrogynous, when vestiges of male flowers are found in the form of empty glumes. The inflorescence is a panicle that shows different degrees of development in the various subgenera and sections of the genus (Ahumada & Vegetti 2009, Bauters et al. 2016). The inflorescences can be summarised in true panicles (Fig. 1a–c); truncated, when the main axis is underdeveloped (Fig. 1d–f), and spicate-glomerulate (Fig. 1g–i). The fruit is a nutlet, smooth or ornamented, subtended by a cupule and frequently surrounded by a hypogynium (Fig. 2). In general, *Scleria* from Madagascar can be classified in two groups. The first encompasses plants with androgynous spikelets arranged in an inflorescence consisting of a linear spike of distant, sessile, spikelet clusters subtended by a short glume-like or foliate bract, and nutlets with a reduced hypogynium. This group of species conforms to *Scleria* subg. *Hypoporum* (Bauters et al. 2016, 2018, 2019). The second covers plants with lateral and terminal panicles made of subandrogynous or unisexual spikelets, and nutlets with a conspicuous hypogynium. This group of species conforms to *Scleria* subg. *Scleria* (Bauters et al. 2016, 2018, 2019). Although the origin of the hypogynium remains obscure (Bauters et al. 2016), the hypogynium is the most informative character to distinguish *Scleria* species, and access to fruiting material is critical for identifying specimens at infrageneric level (Chermeson 1937, Haines & Lye 1983).

Very little is known about *Scleria* pollination and dispersal mechanisms. Wind pollination and hydrochory seem to be common mechanisms. However, *S. gaertneri* Raddi has been found to be potentially dispersed by frugivorous birds and bats in the Mexican tropical rainforest (Galindo-González et al. 2000).

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Fig. 1 Main types of inflorescences of *Scleria* from Madagascar. a. Inflorescence of *S. rosea*; b. inflorescence of *S. trialata*; c. inflorescence of *S. angusta*; d. truncated panicle of *S. melanomphala*; e. truncated panicle of *S. greigii*; f. truncated panicle of *S. foliosa*; g. spicate-glomerulate inflorescence of *S. distans*; h. panicle of *S. hilsenbergii*; i. inflorescence of *S. lithosperma* (a: Ramandimbimanana & Randimbiasison 460; b: Lance 30; c: Mogg 288898; d: Brummit & Singe 232; e: Bosser 15031; f: Raynal 7664; g: Croat 29582; h: Rajaonary 45; i: Frontier-Tanzania Coastal Programme Research Forest 412; all K). — Scale bar: a = 7 cm, b–h = 5 cm, i = 4 cm.

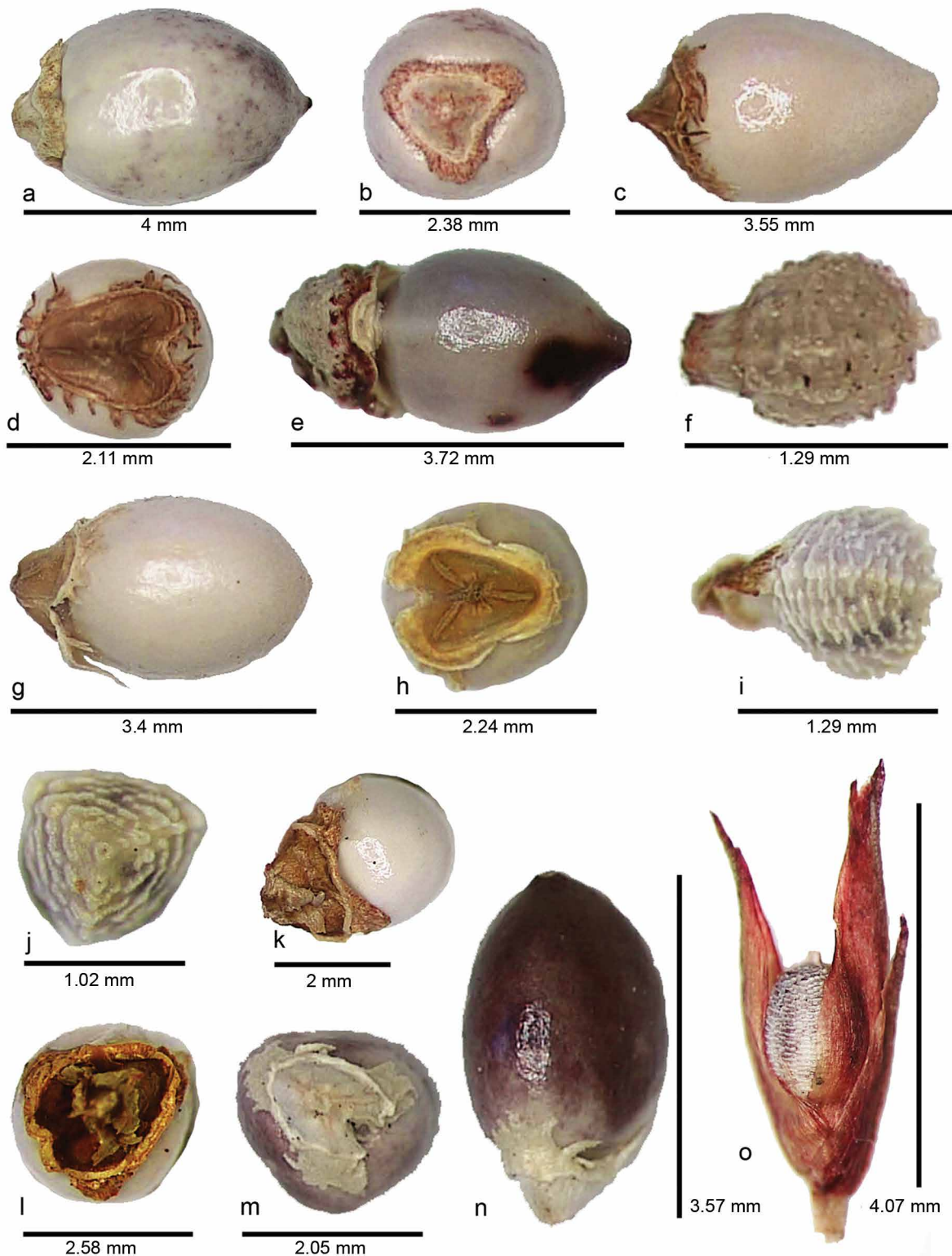


Fig. 2 Nutlets of *Scleria* species occurring in Madagascar. a–b. *S. madagascariensis*; c–d. *S. trialata*; e. *S. baronii*; f. *S. perpusilla*; g–h. *S. rosea*; i–j. *S. hilsenbergii*; k–l. *S. rutenbergiana*; m–n. *S. angusta*; o. *S. andringitrensis* (a–b: Rakotozafy 2741; c–d: Lance 30; e. Hoffman 221; f. Decary 7695; g–h: Ranarivelo 282; i–j. Rajaonary 45; k–l: Wilkin 941; m–n: Boivin s.n.; o: Perrier de la Bâthie 14385; all K).

The first efforts to explore the sedge diversity in Madagascar began at the end of the 19th century with Rev. Richard Baron. In his 'Compendium des plantes Malgaches' (Baron 1906), he recognised ten species of *Scleria* plus *Acriulus*. For a long time, the genus *Acriulus* Ridl. (described with 3 species; Clarke 1908), was placed either in or close to *Scleria*. It was finally accepted as the single species *Scleria greigiifolia* (Ridl.) C.B. Clarke (Kern 1963, Robinson 1966, Franklin Hennessy 1985), and this has been recently verified in molecular analyses (Bauters et al. 2016). In 1937, Henri Chermeson published the first major revision of the *Cyperaceae* of Madagascar, which was included in

Henri Humbert's 'Flore de Madagascar et des Comores'. Chermeson (1937) recognised four genera in the tribe *Sclerieae*: *Eriospora* Hochst. ex A. Rich. (now *Coleochloa* placed in tribe *Trilepidae*; Semmouri et al. 2019), *Diplacrum* (tribe *Bisboeckelerae*; Semmouri et al. 2019), *Acriulus* and *Scleria*. In his publication, which constitutes the only revision of *Scleria* from Madagascar published to date, Chermeson (1937) identified 22 species and two varieties of *Scleria*, 12 of which were endemic. Currently, Govaerts et al. (2019) lists 26 species as occurring in Madagascar, with six endemics, two near-endemic species, nine species also occurring on mainland Africa, and a further

nine more widely distributed species. *Scleria* is the second largest genus of sedges in Madagascar, and is one of the three genera highlighted in the 'Catalogue of the Vascular Plants of Madagascar' (2018) for which taxonomic revision is necessary.

This study aims to:

1. update the taxonomy of the genus *Scleria* in Madagascar; and
2. study the distribution of the species and elaborate conservation assessments using the IUCN (2012) standard.

MATERIAL & METHODS

Specimens and records were studied from BM, C, GENT, K, MNHN, MO, P and TAN (abbreviations according to Thiers continuously updated). All specimens cited were studied by at least one of the co-authors, except where specifically indicated by n.v. Definitions of all botanical terms follow Beentje (2016), unless specified otherwise. Subgenera and sections here presented follow Bauters et al. (2016), except for subg. *Hypoporum* which follows Bauters et al. (2018). The characters included in the descriptions were studied using a stereo optical microscope Leica S6 E with an amplification up to 40x.

Distribution maps were produced with QGIS v. 2.18 (QGIS Development Team 2018). Coordinates for non-georeferenced specimens were retrieved, where possible, from the Gazetteer to Malagasy botanical collecting localities (Schatz et al. 2003). The primary vegetation map, used to explore ecological preferences in the distribution of the species and sections, was downloaded from the Kew GIS unit Madagascar Project (Du Puy & Moat 1996). The ecoregions map was retrieved from The Nature Conservancy (Majka & Platt 2009).

For the conservation assessments, the IUCN (2012) and IUCN Standards and Petitions Subcommittee (2017) were followed. Area of Occupancy (AOO) and Extent of Occurrence (EOO) were calculated with GeoCAT (Bachman et al. 2011). For endemic species known from three or less georeferenced collections, a precautionary principle has been applied as proposed by Callmander et al. (2011).

RESULTS

In total, 422 specimens were identified to species level, 350 of which were included in the distribution maps. 26 *Scleria* taxa from Madagascar were identified in the morphological study: eight endemics; one restricted to Madagascar, the Comoros and Mayotte; one present in Madagascar and the coast of Natal; eight African taxa; five also present in America; two also occurring in Asia and Australia; and one pantropical species. It is important to note that although Govaerts et al. (2018) and our results refer to the same number of taxa, we do not actually refer to the same taxa in all cases (see further). The taxa belonged to two subgenera (*Hypoporum* and *Scleria*) and 11 sections (Table 1). Sections *Abortivae* Cherm. ex Bauters, *Hypoporum* and *Foveolidia* Raf. encompass 18 taxa in total, and 52 % of the records correspond to the first two. Nearly all studied herbarium specimens could be identified to species level based on previously published studies (e.g., Chermezon 1937, Haines & Lye 1983). A small number of specimens showed sufficient morphological deviation from published species descriptions to potentially represent new species to science. Because only one or two specimens were found to represent these putative taxa, they are not formally described until new collections can be made and examined. However, these specimens are listed below the taxonomic treatment.

Most taxonomic changes are due to our broader knowledge of the genus and recent molecular evidence (Bauters et al. 2016, 2018). Forty-seven lectotypifications are made. *Scleria achtenii* De Wild. is reported for the first time from Madagascar, and *S. abortiva* Nees ex Kunth is here considered to be a synonym of *S. trialata* Poir. Also, we propose to recognise the taxon *S. rosea* Cherm. (Chermezon 1923: 298; Fig. 2g–h) at species level. This taxon was treated as a variety of *S. trialata* by Chermezon (1927 '1928', 1937), and is currently accepted as a synonym of *S. trialata* (Govaerts et al. 2019). There are four species for which we could not locate any specimens collected in Madagascar, despite having been listed as occurring in Madagascar (Govaerts et al. 2019; Madagascar Catalogue 2018). These are *S. bambariensis* Cherm., *S. lacustris* C. Wright, *S. hirtella* Sw. and *S. secans* (L.) Urb. They may have been listed

Table 1 Overview of the *Scleria* species occurring in Madagascar.

Subgenus	Section	Species*
<i>Scleria</i> subg. <i>Hypoporum</i>	<i>Scleria</i> sect. <i>Lithospermae</i> (C.B. Clarke) C.B. Clarke	1. <i>Scleria lithosperma</i> (L.) Sw. var. <i>lithosperma</i>
	<i>Scleria</i> sect. <i>Hypoporum</i> (Nees) C.B. Clarke	2. <i>Scleria andringitrensis</i> Cherm.
		3. <i>Scleria ankaratrensis</i> Bauters
		4. <i>Scleria bulbifera</i> Hochst. ex A. Rich.
		5. <i>Scleria distans</i> Poir. var. <i>distans</i>
		6. <i>Scleria distans</i> var. <i>chondrocarpa</i> (Nelmes) Lye
		7. <i>Scleria hilsenbergii</i> Ridl.
		8. <i>Scleria perpusilla</i> Cherm.
		9. <i>Scleria pooides</i> Ridl.
<i>Scleria</i> subg. <i>Scleria</i>	<i>Scleria</i> sect. <i>Margaleia</i> Raf.	10. <i>Scleria poiformis</i> Retz.
	<i>Scleria</i> sect. <i>Acriulus</i> (Ridl.) R.W. Haines & Lye	11. <i>Scleria greigiifolia</i> (Ridl.) C.B. Clarke
	<i>Scleria</i> sect. <i>Melanomphalae</i> Bauters	12. <i>Scleria melanomphala</i> Kunth
	<i>Scleria</i> sect. <i>Hymenolytrum</i> (Schrader) ex Nees Core	13. <i>Scleria boivinii</i> Steud.
	<i>Scleria</i> sect. <i>Foveolidia</i> Raf.	14. <i>Scleria achtenii</i> De Wild.
		15. <i>Scleria foliosa</i> Hochst. ex A. Rich.
		16. <i>Scleria hildebrandtii</i> Boeckeler
		17. <i>Scleria lagoensis</i> Boeckeler
		18. <i>Scleria tessellata</i> Willd.
	<i>Scleria</i> sect. <i>Elatae</i> C.B. Clarke	19. <i>Scleria rutenbergiana</i> Boeckeler
	<i>Scleria</i> sect. <i>Abortivae</i> Cherm. ex Bauters	20. <i>Scleria angusta</i> Nees ex Kunth
		21. <i>Scleria baronii</i> C.B. Clarke
		22. <i>Scleria madagascariensis</i> Boeckeler
		23. <i>Scleria rosea</i> Cherm.
		24. <i>Scleria trialata</i> Poir.
	<i>Scleria</i> sect. <i>Scleria</i> P.J. Bergius	25. <i>Scleria gaertneri</i> Raddi
	<i>Scleria</i> sect. <i>Ophryoscleria</i> (Nees) C.B. Clarke	26. <i>Scleria racemosa</i> Poir.

* The species are listed in this order in the Taxonomic treatment of *Scleria* species of Madagascar below.

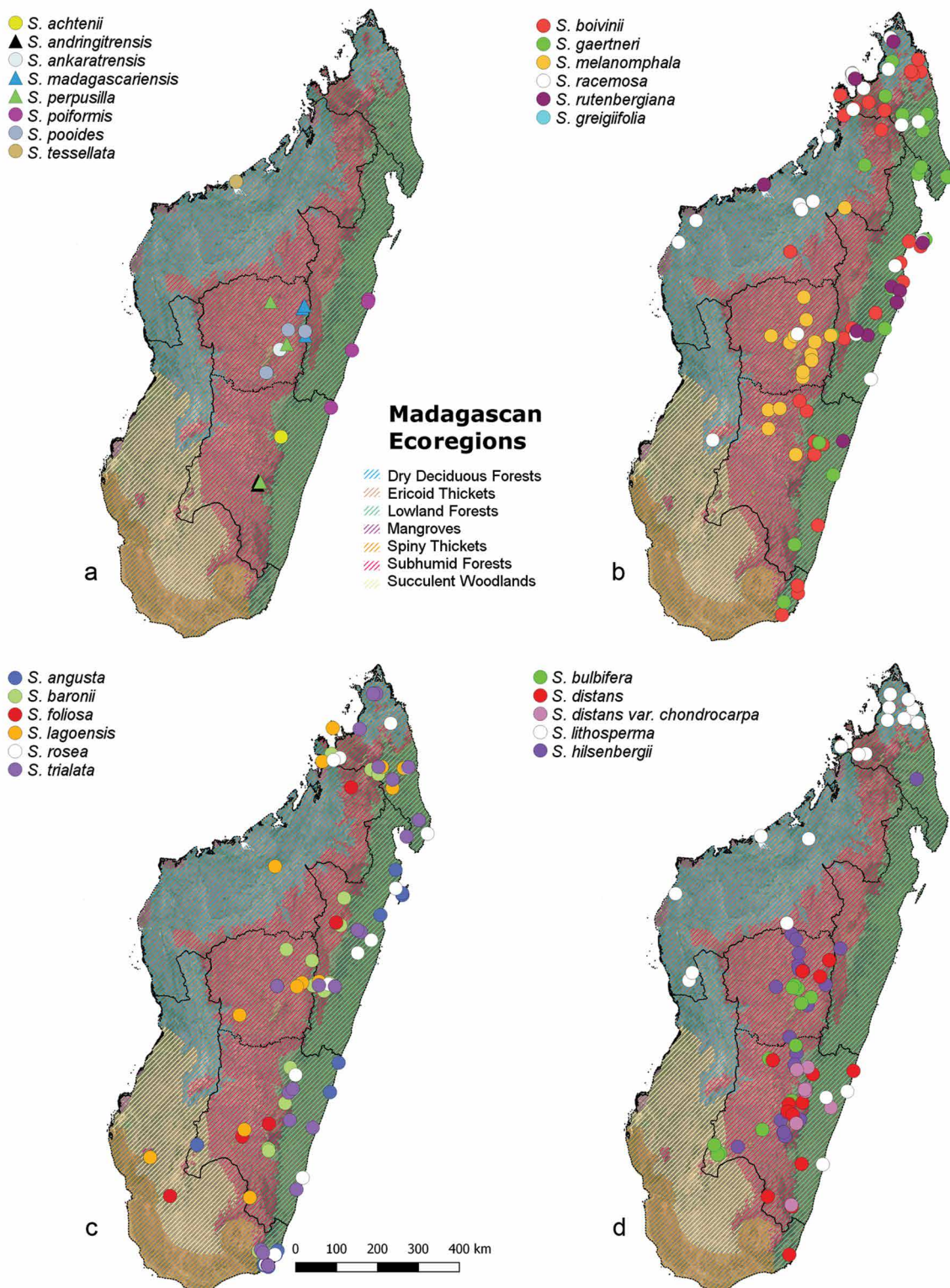


Fig. 3 Distribution maps for all *Scleria* species known to occur in Madagascar. The points represent herbarium vouchers from K, MO and P. The black lines indicate the six provinces of Madagascar. The coloured areas represent the seven ecoregions of Madagascar (Majika & Platt 2009). a. Species known from less than four georeferenced collections, the triangles represent species assessed as threatened; b. species that belong to sections with only one species in Madagascar; c. species from subg. *Scleria* sections *Abortivae* and *Foveolidia*; d. species of subg. *Hypoporum*.

as occurring in Madagascar based on incorrectly identified specimens. The latter two species are in fact restricted to Central and South America (Bauters et al. 2016, 2019) but are morphologically very similar to their African relatives *S. distans* Poir. and *S. boivinii* Steud. Descriptions for all 26 taxa, including notes on distribution, habitat, phenology, and ethnobotanical considerations, are provided in the taxonomic treatment below. Fig. 3 shows the known collecting localities of the *Scleria* species from Madagascar. *Scleria* species occur in all Madagascan ecoregions, however, a spatial bias is very evident, with most

vouchers collected in easily accessible spots along the main road network. Eight species are known from four or fewer georeferenced localities (Fig. 3a). Of these eight species, four are widespread outside Madagascar and four are endemic: *S. madagascariensis* Boeckeler (Fig. 2a–b), *S. perpusilla* Cherm. (Fig. 2f), *S. andringitrensis* Cherm. (Fig. 2o), and *S. ankaratrensis* Bauters (Bauters et al. 2018). Except for the recently discovered, *S. ankaratrensis*, none of these range-restricted species have been collected in the last 27 years. Clear differences in habitat preference were recovered based on the

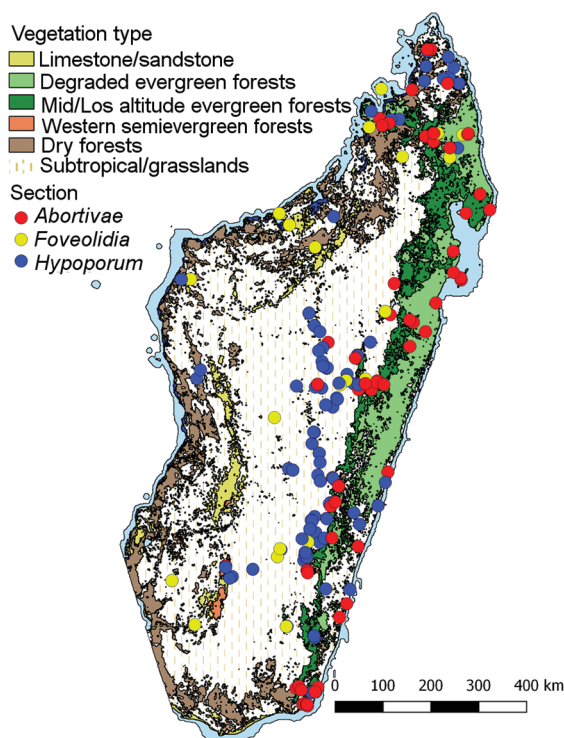


Fig. 4 Occurrences of subg. *Scleria* sect. *Abortivae* and sect. *Foveolidia* and of subg. *Hypoporum* plotted against the map of primary vegetation (Du Puy & Moat 1996).

occurrence data. The species of subg. *Scleria* sect. *Abortivae* are mostly restricted to the eastern evergreen forests, while those of subg. *Hypoporum* to dryer vegetation types of Central Madagascar (Fig. 4). This may explain why species of subg. *Hypoporum* have mostly been collected during the wet season when plants are flowering and fruiting, in contrast to species of sect. *Abortivae* which have been collected throughout the year since they flower and fruit more constantly.

KEY TO SPECIES OF *SCLERIA* FROM MADAGASCAR

1. Most spikelets androgynous; hypogynium absent (sect. *Hypoporum*) 2
1. Most spikelets unisexual or subandrogynous; hypogynium conspicuous (except for *S. baronii*) 10
2. Inflorescence with lateral panicles subtended by leafy bracts (Fig. 11); nutlets smooth with 3 depressions at the base 1. *S. lithosperma*
2. Inflorescence made of a single terminal spike or panicle, without leafy bracts; nutlets different 3
3. Inflorescence a terminal lax panicle 4
3. Inflorescence a terminal spicate-glomerate panicle 5
4. Glomerules with 2–5 spikelets (Fig. 1h); nutlets 1–1.3 by 0.7–1 mm diam, trigonous, wrinkles arranged mainly transversally (Fig. 2i–j); culms puberulous at least at the base; annual plants 7. *S. hilsenbergii*
4. Single spikelets held by slender and flexuous branches; nutlets 1–1.5 mm long, ovoid to globose, tuberculate; culms glabrous; perennial plants, rhizomatous 9. *S. poooides*
5. Plants annual, culms < 20 cm 6
5. Plants perennial, culms > 20 cm 7
6. Culm < 10 cm; nutlets < 1.5 mm long, wrinkled (Fig. 2f) 8. *S. perpusilla*
6. Culm > 10 cm; nutlets ≥ 1.5 mm long; slightly trabeculate 3. *S. ankaratrensis*

7. Glomerules erect 8
7. Glomerules reflexed (Fig. 1g) 9
8. Conspicuous tubers present at the base of the culm; nutlets reticulate or tuberculate 4. *S. bulbifera*
8. No tubers present; nutlets with raised transverse ridges but not tuberculate 2. *S. andringitrensis*
9. Nutlets smooth 5. *S. distans* var. *distans*
9. Nutlets ornamented 6. *S. distans* var. *chondrocarpa*
10. Inflorescence a single terminal dense panicle, without leafy bracts, small lateral panicles rarely present; stout aquatic perennial, rhizomatous 10. *S. poliformis*
10. Inflorescence always with leafy bracts (flower-bearing branches therefore in terminal and lateral positions); terrestrial annuals or perennials 11
11. Panicles truncated (main axis underdeveloped; Fig. 1d–e) 12
11. True panicles, pyramidal or at least main axis well developed (Fig. 1a–c) 18
12. Hypogynium loosely attached to the nutlet; nutlets frequently ornamented; culm < 1 m; leaves; annual plants or perennials with short rhizome (sect. *Foveolidia*) 13
12. Hypogynium appressed; nutlets smooth; perennials with thick rhizome 17
13. Nutlets 3.5 by 1.7–2 mm, oblong, smooth, sometimes very slightly pitted, white; hypogynium without conspicuous lobes, margin obscure with red dots 16. *S. hildebrandtii*
13. Nutlets either hairy at the base or (partially or entirely) reticulate; hypogynium clearly lobed 14
14. Culm conspicuously triquetrous, perennial; nutlets slightly pitted, hairy underneath; hypogynium with three slender lobes 17. *S. lagoensis*
14. Culm trigonous, annual or perennial; nutlets clearly pitted or reticulated, at least in the basal half; hypogynium different 15
15. Perennial with reddish rhizome; nutlets white, pitted, hairy; hypogynium with long lobes, 2–3-fid; leaves 20–25 by 0.4–0.5 cm, sheath scabrid 14. *S. achtenii*
15. Annual plants; nutlets reticulate but glabrous; leaves < 30 cm long 16
16. Lateral panicles in pairs, peduncle 3–15 cm; nutlets ovoid, 3.5 by 2.5 mm, reticulated but smooth at the apex, white; hypogynium with lobes rounded, contraligule rounded 15. *S. foliosa*
16. Lateral panicles solitary; nutlets oblong, 3–3.5 by 1.5–2 mm, regularly tessellate, white; hypogynium trilobed, loosely appressed to the nutlets, yellowish brown; contraligule truncate 18. *S. tessellata*
17. Nutlets 4–4.5 by 2–3 mm, beaked, white; hypogynium embracing the stipe; peduncle up to 20 cm, flexuous (Fig. 1e); leaves glabrous; contraligule absent; glumes densely ciliate inside 11. *S. greigiifolia*
17. Nutlets 3–3.5 by 2–2.5 mm oblong, apex dark (Fig. 1d); peduncle > 15 cm; leaves with margin ciliate at the proximal part; contraligule truncated, obtuse, slightly membranous on the margin, glumes glabrous inside and hairy externally 12. *S. melanomphala*
18. Hypogynium heart-shaped with lacinate lobes 19
18. Hypogynium never lacinate 21
19. Culm < 1.5 m, spikelet, rachilla and prophyll red/purple; glumes straw-coloured to dark purple/reddish, margin ciliate; lateral panicles shorter than the internode (Fig. 1a) 23. *S. rosea*
19. Culm > 1.5 m; stem, spikelet, rachilla and glumes straw-coloured or brown; lateral panicles shorter or longer than the internode 20

20. Lateral panicles generally shorter than the internode (Fig. 1c); leaves largely acuminate, pleated when pressed; glumes straw-coloured, ciliate at the base; (Fig. 2m–n). 20. *S. angusta*
20. Lateral panicles longer than the internode (Fig. 1b); leaves pseudopraemorse, not pleated when dried; external glumes brownish but purple/red on the margins, internals purplish (Fig. 2c–d). 24. *S. trialata*
21. Hypogynium clearly trilobed 22
21. Hypogynium without distinctive lobes 24
22. Inflorescence including glumes, prophyll and rachilla red; leaves pseudopraemorse; sheaths winged; contraligule membranous; nutlets ovoid; hypogynium with lobes short and dentate (Fig. 2a–b) 22. *S. madagascariensis*
22. Inflorescence straw-coloured; nutlets globose to ovoid; lobes of the hypogynium never dentate 23
23. Nutlets hairy in basal half; hypogynium deeply trilobed, margin revolute; rachilla reddish, flattened; glumes straw-coloured with reddish margin and green midrib 25. *S. gaertneri*
23. Nutlets glabrous; lobes of hypogynium truncated (Fig. 2k–l); rachilla scabrid; glumes uniformly straw-coloured 19. *S. rutenbergiana*
24. Perennial climber up to 10 m, tufted at the base; leaves very sharp, not pseudopraemorse; staminal crest up to 1 mm; nutlet minutely hairy; hypogynium revolute 13. *S. boivinii*
24. Stout perennials up to 2.5–3 m; leaves pseudopraemorse; staminal crest slightly developed; nutlets glabrous, smooth; hypogynium either ciliate or very reduced 25
25. Nutlets 4.5–5 by 3–4 mm, beige, style persistent; hypogynium regularly ciliate; cupule thickened; culm up to 3 m; sheaths winged 26. *S. racemosa*
25. Nutlets 2.5–3 by 2–2.5 mm; style deciduous; hypogynium very reduced; cupule thick and dark (Fig. 2e); sheaths not winged 21. *S. baronii*

TAXONOMIC TREATMENT OF THE SCLERIA SPECIES FROM MADAGASCAR

Scleria (subg. *Hypoporum*) sect. *Lithospermae* (C.B. Clarke)
C.B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8 (1908) 132

1. *Scleria lithosperma* (L.) Sw. var. *lithosperma*

Scleria lithosperma (L.) Sw. (1788) 18 var. *lithosperma*. — *Scirpus lithospermus* L. (1753) 51. — *Schoenus lithospermus* (L.) L. (1762) 65. — *Carex lithosperma* (L.) L. (1774) 706. — *Hypoporum lithospermum* (L.) Nees (1842) 117. — *Scleria wightiana* Steud., nom. superfl. (1855) 176. — Lectotype designated by Camelbeke & Goetghebeur (2000): India, plate 48 in Rheedea, Hort. Malab. 12 (1693).

Scleria margaritifera Gaertn. (1788) 13. — Type: Fruct. 1 (1788) 13, t. 12.

Scleria tenuis Retz. (1786) 13. — *Carex tenuis* (Retz.) J.F. Gmel. (1791) 138. — Type: *Koenig s.n.* (lectotype designated here: LD1277858), Sri Lanka.

Scleria filiformis Sw. (1788) 19. — *Carex subulata* J.F. Gmel. (1791) 138. — *Scleria subulata* (J.F. Gmel.) Steud. (1840) 296. — *Scleria lithosperma* var. *filiformis* (Sw.) Britton (1885) 231. — Type: *Banks s.n.* (lectotype designated here: K00058443), Hispaniola.

Scleria gracilis Rich. (1792) 113. — Type: *Leblond s.n.* (type P, not found), French Guiana.

Scleria purpurea Poir. (1806) 4. — *Hypoporum purpurascens* Nees (1834) 303, nom. illeg. — Type: *Collector unknown* (type not located), U.S. Virgin Islands, Saint Thomas.

Scleria capillaris R.Br. (1810) 240. — *Hypoporum capillare* (R.Br.) Nees (1834) 303. — Type: *R. Brown 6069* (lectotype designated by Bauters et al. 2019: K000960246; isotypes BM00090054, E00393211), Australia, North Australia, Arnhem South Bay, 1802.

Scleria elongata J.Presl & C.Presl (1828) 202. — Type: *Haenke s.n.* (lectotype designated here: PRC450377), Mexico, Acapulco.

Scleria glaucescens J.Presl & C.Presl (1828) 202. — Type: *Haenke s.n.* (lectotype designated here: PRC450376), Philippines.

Hypoporum sieberi Nees (1834) 303, nom. inval.

Scleria krugiana Boeckeler (1888) 35. — Type: *Sintenis 4945* (lectotype designated by Bauters et al. 2019: LD1644490; isolectotypes BM000629124, JE00005190, L0042770, S13-19138), Puerto Rico, Jabucoa.

Scleria puzzolanea K.Schum. (Engler 1894) 28, nom. inval. based on *Holst 2797* (K), Tanzania, Tanga District, Amboni.

Scleria lithosperma f. *ramosa* Domin (1915) 487, nom. nud. in synon.

Rhizomatous perennial, caespitose. Culm 60–80 cm, glabrous to puberulous. Leaves 10–35 cm by 1–4 mm, puberulent; sheaths finely pilose to glabrescent; contraligule triangular, densely ciliate. Inflorescence spiciform, terminal and lateral, unbranched, with 3–5 glomerules (Fig. 1i), laterals subtended by leafy bracts. Spikelets androgynous, 4–5.5 mm long, glumes glabrous. Nutlet 2 by 1.5 mm, ovoid to obovoid, smooth, trigonous, with three depressions at the base.

Distribution — Pantropical. It is a very widespread species which grows in maritime regions, but also present in semi-dry grasslands, croplands and disturbed areas (Simpson & Inglis 2001, Naczi & Ford 2008). In West Polynesia, it is a weed (Holm et al. 1979).

Habitat & Ecology — In Madagascar, present along the southeastern and northwest coast, in low altitude dry and semideciduous forest, rarely over alt. 600 m.

Conservation — *Scleria lithosperma* is pantropical, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antsiranana, Daraina, 81 m, 2 Mar. 2005, L. Nusbaumer & P. Ranirison LN1526 (G, K); Bassin de Biromba, 217 m, 28 May 2001, S. Wholhauser & H. Andriamalaza SW448 (G, K); Daraina, 204 m, 20 Mar. 2004, L. Gautier et al. LG4654 (G, K); Daraina, 325 m, 5 Mar. 2003, L. Gautier et al. LG4230 (G, K).

Note — Because of its leafy bracts and lateral panicles, it is included in its own sect. *Lithospermae* (Clarke 1908, Chermeson 1937, Bauters et al. 2018). Previously, Haines & Lye (1983) placed this species in sect. *Corymbosae* Pax. The other variety, *Scleria lithosperma* var. *linearis* Benth., is restricted to tropical Asia and Australia. It is used to treat skin infections and diseases in India (Vijayan et al. 2007, Chendurpandy et al. 2010, Rani et al. 2011). In Tanzania, it is used in treatments for dysmenorrhoea and to help during childbirth (Burkill 1985).

Scleria (subg. *Hypoporum*) sect. *Hypoporum* (Nees)
C.B. Clarke in Hook., Fl. Brit. India 6 (1984) 685

2. *Scleria andringitrensis* Cherm.

Scleria andringitrensis Cherm. (1923) 297. — Type: *Perrier de la Bâthie 14385* (lectotype designated by Bauters et al. 2019: P00457098; isolectotypes: K000363345, P00457099, P00457100, TAN000431), Madagascar, Fianarantsoa, Massif de l'Andringitra, 2200 m, Mar. 1922.

Perennial, caespitose. Culms 20–30 cm by 0.5–0.8 mm, glabrous. Leaves 1–1.5 mm broad, glabrous, sheaths glabrous; contraligule hairy. Inflorescence a 15 cm spike with unbranched glomerules spread every 2–3 cm; each glomerule consists of 1–3 erect androgynous spikelets. Spikelets with glumes 5–5.5 mm long; glumes glabrous, reddish. Nutlet 1.3 by 1 mm, ellipsoid, white, conspicuously transversally striated (Fig. 2o).

Distribution — Endemic to Madagascar.

Habitat & Ecology — Endemic to the Andringitra Massif, growing in ericoid forest, alt. 1600–2200 m.

Conservation — *Scleria andringitrensis* is endemic to Madagascar and found only in the Andringitra Protected Area. This species is only known from two herbarium specimens, the most recent of which was collected in 1970. The estimation of AOO (8 km²) does not exceed the value of the Critical Endangered category, and the species is only known from one location. This

species and its habitat are threatened by grazing and increased frequency of fires for the renewal of pastures (F. Rakotonasolo, pers. comm. 2017). Therefore, it is assessed as Critically Endangered under the criterion B2ab(ii,iii).

Additional specimens. MADAGASCAR, Fianarantsoa, Massif de l'Andringitra, 2200 m, Mar. 1922, *H. Perrier de la Bâthie* 14385 (K); *ibid.*, 1700 m, 2 Mar. 1970, *J.L. Guillaumet* 3502 (P01898843); Reserve Naturelle Intégrale Andringitra, Plateau d'Andohariana, 1950–2000 m, S22°10' E046°54', 5 Feb. 1997, *C. Rakotavao et al.* 753 (K).

Note — The shape and ornamentation of the nutlets of *S. andringitrensis* is unique amongst the rest of Madagascan species, and makes it very easy to identify.

3. *Scleria ankaratrensis* Bauters

Scleria ankaratrensis Bauters (2018) 17. — Type: *Larridon et al.* 2010-0340 (holotype GENT; isotypes K, TAN), Madagascar, Ankaratra, Lac Froid, S19°20'45.0" E47°20'19.8", 1650 m, 24 Apr. 2010.

Tufted annual, slightly decumbent. **Culms** up to 22 cm tall, with white hairs (up to 0.2 mm). **Leaves** up to 26 cm by 1–1.2 mm, densely hairy with white hairs (c. 0.2 mm long); sheaths glabrous to densely hairy with a convex, hairy contrailegule. **Inflorescence** terminal, glomerate spicate, up to 9 cm long, sometimes slightly branched near the base, branches not longer than 1 cm; up to 6 glomerules along the main axis. **Glomerules** consisting of 2–4 spikelets. **Spikelets** 4–4.5 mm long; glumes densely hairy on the midrib (pistillate ones). **Nutlet** c. 1.5 by 0.8 mm broad, obovoid, surface slightly trabeculate, trigonous stipe darker in colour.

Distribution — Only known from Ankaratra in Madagascar.

Habitat & Ecology — Boggy lake edges.

Conservation — Since this species has only recently been discovered, more information is needed to perform a detailed conservation assessment. Therefore, it is currently indicated as Data Deficient.

4. *Scleria bulbifera* Hochst. ex A.Rich.

Scleria bulbifera Hochst. ex A.Rich. (1850) 510. — Type: *Schimper III* 1557 (lectotype designated by Bauters et al. 2019: P00465915; isoelectotypes BR0000008454294, BR0000008638458, E00200224, GENT, GOET002935, K000320846, M0107104, MO-2204657, P00465917), Ethiopia, Sana, In montibus prope Dochli, 5 Aug. 1841.

Scleria atosanguinea Hochst. ex Steud. (1855) 175. — Type: *Schimper III* 327 (lectotype designated by Bauters et al. 2019: P00465919; isoelectotypes B†, BR0000008454621, GENT, K000320849, K000320850, LG0000090029172, M0107109, M0107108, MPU012533, P00465920, P00465921, S13-18976, S13-18978, STU000378, STU000379, WU0073559), Ethiopia, Adoa, Montis Scholada, 3 Oct. 1837.

Scleria schweinfurthiana Boeckeler (1879) 570. — *Scleria bulbifera* var. *schweinfurthiana* (Boeckeler) Piérart (1953) 26. — Type: *Schweinfurth* 2193 (lectotype designated by Franklin Hennessy (1985) 518: K000320848; isoelectotype B†, P00465918), Sudan, Grosse Seriba Ghattas, Lande der Djur, 27 July 1869.

Scleria bulbifera var. *pallidiflora* Ridl. (1884a) 167 (as '*Scleria bulbosa*'). — Type: *Welwitsch* 7133 (lectotype designated here: BM000922701), Angola, Lower Guinea Pungo Andongo, in pratis humidis peculiaribus, Mar. 1857.

Scleria mechowiana Boeckeler (1884) 510. — *Scleria bulbifera* var. *mechowiana* (Boeckeler) Kük. (1938) 530. — Type: *Von Mechow* 345 (lectotype designated by Bauters et al. 2019: JE00006528; isoelectotype B†), Angola, Malange, Oct. 1879.

Scleria buchananii Boeckeler (1888) 33. — Type: *Buchanan* 32 (lectotype designated by Robinson 1966: 503: K000363340; isoelectotypes B†, P00465922), Malawi, Shiri highlands, July 1885.

Scleria cenchroides Hochst., nom. nud. in synon. (Clarke 1895) 669.

Scleria bojeri C.B. Clarke (1895) 669, nom. inval. based on specimen: *Hilsenberg & Bojer s.n.* (BM000922713), Madagascar.

Scleria buchananii var. *latifolia* De Wild. (1919) 20. — *Scleria bulbifera* var. *latifolia* (De Wild.) Piérart (1953) 26. — Type: *Ringoet* 485 (lectotype designated by Bauters et al. 2019: BR0000005571628; isoelectotype BR0000005571604), Democratic Republic of Congo, Katanga, Schinsenda,

6 Mar. 1912. Residual syntype: *Homblé* 55 (BR0000008638489), Democratic Republic of Congo, Elisabethville, Feb. 1912.

Scleria verdickii De Wild. (1926) 26. — Type: *Verdick* 398 (lectotype designated here: BR0000008638533), Democratic Republic of Congo, Katanga, Lukafu, Mar. 1900.

Scleria buchananii var. *typica* Gross (1932) 658, nom. nud.

Scleria buchananii var. *laevinus* Gross (1932) 658, nom. nud.

Perennial, bulbous at the base. **Tubers** 0.5–1.0 cm thick, brown, covered by old leaves and connected by thin stolons. **Culm** glabrous to puberulous, 50–100 cm long. **Leaves** 20–30 by 0.2–0.7 cm, puberulous, pale green. **Inflorescence** a terminal spike, 10 cm long, made up of 4–10 erect unbranched glomerules; basal glomerules with bracts less than 1.5 cm long. **Spikelets** androgynous; glumes 4–5 mm long, purple, scabrid, sometimes with hairs. **Nutlet** 1–1.5 mm diam, smooth to slightly verrucose, with tubercles transversally arranged.

Distribution — Tropical and South Africa, Madagascar and Arabian Peninsula.

Habitat & Ecology — In Madagascar, it is restricted to the Central Plateau and Highlands. The species occurs in grasslands and mixed woodland grasslands, on siliceous soils, alt. 800–1500 m.

Conservation — *Scleria bulbifera* is widely distributed in Africa and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antananarivo, Antsirabe, Sahatsiho, 1600 m, 24. Dec. 1928, *H. Humbert* 7124 (P01707777, K); *ibid.*, 1500 m, Oct. 1913, *H. Perrier de la Bâthie* 2661 (P01707770); Central Madagascar, Oct. 1882, *R. Baron* 2003 (K, P01707771, P01707772); Fianarantsoa, Massif de l'Andringitra, 1600–2000 m, Nov.–Dec. 1924, *H. Humbert* 3636 (P01707773, P01707774); Ihosy, Isalo, 856 m, 23 Jan. 2008, *M. Andriamahay & S. Rokotoarisoa* SNGF1859 (K, SNGF, TEF); Toliara, Antanimena-Iremo, 4. Dec. 2012, *F. Rakotonasolo* RNF2093 (K, P01063613, TAN).

Note — Gordon-Gray (1995) pointed that *S. bulbifera* shows a wide range of nutlet morphologies. Further research is needed to assess its intraspecific variation.

5. *Scleria distans* Poir. var. *distans*

Scleria distans Poir. (1806) 4 var. *distans*. — *Hypoporum distans* (Poir.) Nees (1842) 171. — Type: *Ledru* 110 (lectotype designated by Raynal (1976) 214, 216: P00274452; isoelectotypes P00274453, P00274454), Puerto Rico, 1797.

Cenchrus hirsutus Spreng. (1822) 15. — Type: *Collector unknown* (holotype B†), Hispaniola.

Hypoporum humile Nees (1834) 303, nom. nud.

Scleria mollis Kunth (1837) 351. — Type: *Sellow s.n.* (lectotype designated by Bauters et al. 2019: K001081692; isoelectotype B†), Brazil.

Scleria nutans Willd. ex Kunth (1837) 351. — *Hypoporum nutans* (Willd. ex Kunth) Nees (1842) 170. — *Scleria hirtella* var. *glabrescens* Boeckeler (1869) 151. — Type: *Von Humboldt s.n.* (lectotype designated here: B-W17336; isoelectotypes P00274463, P00274464, P0066517), Venezuela.

Scleria cenchroides Kunth (1837) 352. — Type: *Drège* 4365 (lectotype designated by Bauters et al. 2019: HAL0082047; isoelectotypes K n.v., L0042779, P00465931, P00465932, P00465933, S1319036, TUB007471), South Africa.

Acorus brasiliensis Schott ex Nees (1842) 170, nom. nud. in synon.

Anerma hispidula Schrad. ex Nees (1842) 170, nom. nud. in synon.

Scleria michauxii Chapm. (1860) 532. — Type: *Michaux s.n.* (lectotype designated by Bauters et al. 2019: P00169707; isoelectotype P00668894), USA, Florida.

Scleria humilis (Nees) Britton (1885) 235, nom. nud.

Scleria hirtella var. *pauciciliata* Britton (1885) 236. — *Scleria tenella* 'sensu Griseb.' (1866) 249, non *Scleria tenella* Kunth (1837) 353. — Type: *Wright* 3418 (lectotype designated by Bauters et al. 2019: GH00549023; isoelectotype MA607212, MO716305), Cuba, San Juan de Buenavista.

Scleria hirtella var. *tuberculata* Boeckeler ex C.B. Clarke (1898) 294. — Type: *Burke* 62 (lectotype designated here: K000363498), South Africa, Transvaal.

Scleria hirtella auct. mult., non *Scleria hirtella* Sw. (1788) 19.

Perennial, rhizome 2–3 mm diam. *Culms* 20–50 cm, arising every 1–2 cm along the rhizome, sometimes thickened at the base. *Leaves* 10–15 cm by 2–5 mm, puberulous, less often glabrous; sheaths hairy; contraligule strongly ciliate. *Inflorescence* a terminal spike, 8–10 cm long, with 4–8 glomerules; glomerules unbranched, reflexed (Fig. 1g). *Spikelets* androgynous; glumes 4–4.5 mm, straw-coloured, villose, awned; hairs white, dark towards the apex. *Nutlets* 1–2 mm long, obovoid, white, smooth.

Distribution — (Sub)tropical America, Tropical Africa and Madagascar.

Habitat & Ecology — In Madagascar, it is found on the Central High Plateau.

Conservation — *Scleria distans* var. *distans* is widely distributed in (sub)tropical America, Tropical Africa and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, 1867, *Lyall* 209 (K); *ibid.*, *Lyall* s.n. (K); Central Madagascar, Dec. 1883, *R. Baron* 397 (K).

Note — Most vouchers of *S. distans* in Madagascar belong to the variety *chondrocarpa*. In South America, the rhizome is smashed and drunk as mate or tereré, to treat diabetes and intestinal parasites (Pin et al. 2009).

6. *Scleria distans* var. *chondrocarpa* (Nelmes) Lye

Scleria distans var. *chondrocarpa* (Nelmes) Lye (1983) 243. — *Scleria hirtella* var. *chondrocarpa* Nelmes (1955) 451. — Type: *Thomas* 95 (holotype K000321076; isotype KAW), Uganda, Bugala Island, Kalangala, 1170 m, 5 June 1932.

Shares all characters with the type variety but has ornamented nutlets, i.e., nutlets are transversely wrinkled or tuberculate (although not equally pronounced across the specimens).

Distribution — Eastern Africa and Madagascar.

Habitat & Ecology — In Madagascar, it is found in canopy gaps, degraded mid altitude evergreen forest, and grasslands, alt. 700–1600 m. Less frequent along the low altitude evergreen forest.

Conservation — *Scleria distans* var. *chondrocarpa* is widely distributed in Eastern Africa and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, 7 May 1912, *P.A. Methuen* s.n. (K); Antananarivo, Ankazobe, 25 Mar. 1930, *R. Decary* 7711 (P01707753, TAN); Ivato, 1365 m, 25 Jan. 1975, *T.B. Croat* 29582 (K, MO, P01896575); Intremo Massif, 1300–1400 m, 27 Jan. 1975, *T.B. Croat* 29888 (K, MO, P01896573); Central Madagascar, Oct. 1881, *R. Baron* 801 (K); Aug. 1880, *G.W. Parker* 23 (K); Fianarantsoa, Ranomafana National Park, 1205 m, 21 Apr. 2010, *I. Larridon* et al. 2010-0241 (GENT); *ibid.*, 1128 m, 21 Apr. 2010, *I. Larridon* et al. 2010-0229 (GENT); *ibid.*, 1178 m, 21 Apr. 2010, *I. Larridon* et al. 2010-0248 (GENT); *ibid.*, RN 7, PK 294, 1717 m, 22 Apr. 2010, *I. Larridon* et al. 2010-0279 (GENT); Ambohimombo Forest, 1350–1440 m, Jan. 1895, *Forsyth Major* 226 (K); 33 km south of Iroandro 600 m, 26 Mar. 1993, *D. Turk & M. Beck* 367 (K); Ambohimahamasina, 1941, *Herbier. Jard. Bot* 4550 (K, TAN); South Midongy National Park, 2 Mar. 1927, *R. Decary* 4980 (K); Toamasina, 15 Feb. 1930, *R. Decary* 7137 (P01707752).

Note — The drooping glomerules with black hairs make it very similar to the annual *Scleria melanotricha* Hochst. & A.Rich. However, *S. melanotricha* does not have a creeping rhizome and its nutlet has three conspicuous tubercles mixed with three smooth bands and an orange rugose rim on the stipe. *Scleria melanotricha* is restricted to mainland Africa. In addition, *S. distans* var. *chondrocarpa* has been confused many times with *S. hirtella*, another annual very similar in appearance. However, *S. hirtella* is a strictly American species (Raynal 1976, Camelbeke et al. 2001).

7. *Scleria hilsenbergii* Ridl.

Scleria hilsenbergii Ridl. (1884b) 16. — Type: *Hilsenberg & Bojer* s.n. (lectotype designated here: BM000922714), Madagascar.

Annual. *Culms* puberulous at least at the base, 30–40 cm long. *Leaves* 10–15 cm by 1–1.5 mm, glabrous to puberulent. *Inflorescence* is a terminal lax panicle, 5–10 cm long (Fig. 1h); glomerules with 2–5 spikelets, held by thin erect branches up to 4 cm long. *Spikelets* androgynous; glumes 3–4.5 mm long, straw-coloured or reddish, glabrous; glumes bearing female flowers mucronate (0.5–1 mm). *Nutlet* 1–1.3 by 0.7–1 mm diam, trigonous, densely tuberculate, wrinkles arranged mainly transversally (Fig. 2i–j).

Distribution — Endemic to Madagascar.

Habitat & Ecology — Endemic to Central Madagascar, alt. 1000–1700 m. Wetlands, degraded grasslands and secondary forest patches.

Conservation — *Scleria hilsenbergii* is endemic and widespread in the Central Highland of Madagascar. It is found in Andringitra, Isalo and Marojeje protected areas. There are no specific threats known which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antananarivo, Analamanga Region, 9 Mar. 2010, *F.A. Rajaonary* 45 (K, MO); *ibid.*, June 1961, *J. Bosser* 15071 (K, TAN); Ankatso, 10 Feb. 1923, *M. Decary* 382 (K, P01888589); Itasy Region, Lake Itasy, Jan. 1931, *G.F. Scott Elliot* 1908 (K, P01888593); Antsirabe, Vontovorona, 2035 m, 1 Apr. 1971, *K.A. Lye* 5947 (K); Fianarantsoa, Apr. 2010, *I. Larridon* et al. 2010-0268 (GENT); Andringitra National Park, 1581 m, Apr. 2010, *I. Larridon* et al. 2010-0122 (GENT); Toamasina: Besakay, Apr. 1992, *A. Dhondt* 7 (GENT).

8. *Scleria perpusilla* Cherm.

Scleria perpusilla Cherm. (1929) 557. — Type: *Perrier de la Bâthie* 18433 (lectotype designated by Bauters et al. 2019: P00346040; isolectotypes BR0000013180607, P00346041, US), Madagascar, Antananarivo, Analabé au nord de Tananarive, 1500 m, Feb. 1928.

Annual. *Culms* 3–8 cm by 0.3–0.5 mm, glabrous. *Leaves* 1.5–2.5 cm by 0.75 mm, glabrous. *Inflorescence* a reduced, terminal spike with 1–3 glomerules, each with 1–6 spikelets. *Spikelets* androgynous; glumes 3.5–4.5 cm, dark purple, glabrous. *Nutlet* 1.2 by 1 mm, ellipsoid, white, ornamentation transversely wrinkled to reticulated (Fig. 2f).

Distribution — Endemic to Madagascar.

Habitat & Ecology — Endemic to Central Madagascar. On rocky soils, alt. 1200–1500 m.

Conservation — *Scleria perpusilla* is endemic and only occurs in the Central Highlands of Madagascar. It is known from three locations and found in the Andringitra Protected Area. This species and its habitat are threatened by grazing and pasture fire (F. Rakotonasolo, pers. comm. 2017). Therefore and in combination with its restricted distribution (AOO = 12 km², EOO = 9769 km²), this species is assessed as Endangered under the criteria B2ab(i,ii,iii).

Additional specimens. MADAGASCAR, Antananarivo, 1500 m, Feb. 1928, *H. Perrier de la Bâthie* 18433 (BR, P00346040, P00346041); Ankazobe, Mar. 1930, *R. Decary* 7695 (K, P01888491); *ibid.*, Mar. 1962, *J. Bosser* 15968 (P01888490).

Note — This species may be undercollected because of its small habit. It was collected for the last time in 1962.

9. *Scleria pooides* Ridl.

Scleria pooides Ridl. (1884a) 170. — Type: *Welwitsch* 7142 (lectotype designated by Bauters et al. 2019: LISU222777; isolectotype BM000922698, K000363388, LISU222778), Angola, Huilla, Nov. 1859.

Scleria multispiculata Boeckeler (1888) 36. — Type: *Buchanan* s.n. (lectotype designated by Bauters et al. 2019: K000363389; isolectotypes B†, E00200199, K, P00465996), Malawi, Shiri Highlands, July 1885.

Scleria prophyllata Nelves (1955) 434. — Type: *Milne-Redhead* 3995 (lectotype designated by Bauters et al. 2019: K000363386, isolectotypes BM, BR0000005577842, K000363387, PRE0105028-0), Angola, Moxico, 8 Jan. 1938.

Perennial, rhizomatous. *Culm* 30–40 cm long, glabrous. *Leaves* 12–17 cm by 0.5–1.5 mm, glabrous. *Inflorescence* a terminal lax panicle, 4–8 cm long, with compound branches; glomerules formed by single spikelets subtended by thin flexuous branches. *Spikelets* androgynous; glumes bearing the female flower 2–3 mm long, glabrous to shortly hispidulous, dark. *Nutlet* 1–1.5 mm long, ovoid to globose, tuberculate.

Distribution — Tropical Africa and Madagascar.

Habitat & Ecology — In Madagascar it is found in the central grasslands, alt. 1200–1500 m.

Conservation — *Scleria pooides* is widely distributed in Tropical Africa and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antananarivo, environs de Antsirabe, Jan. 1914, *H. Perrier de la Bâthie* 2727 (P01888480); *ibid.*, Jan. 1956, *J. Bosser* 8921 (P01888479, TAN); Mont Lombony, environs de Antsirabe, 1500 m, Jan. 1920, *H. Perrier de la Bâthie* 12982 (P01888481, TAN001211); forêt de la Mandraka, 1909, *d'Alleizette* 328 (P01888482).

Note — Ridley named this species after the genus *Poa* L. because of the slender and flexuous branches that hold the solitary spikelets. It can be distinguished from *S. hilsenbergii* due to its smaller glumes, solitary spikelets and shorter and crowded panicle. It appears as *S. poaeoides* in the protologue, however, its spelling has been revised to *S. pooides* (Govaerts et al. 2019, IPNI 2018).

Scleria (subg. *Scleria*) sect. *Margaleia* Raf. in Bull. Bot., (Geneva) 1 (1830) 219

10. *Scleria poiformis* Retz.

Scleria poiformis Retz. (1786) 13. — *Carex poiformis* (Retz.) J.F.Gmel. (1791) 138. — Type: *König* s.n. (lectotype designated here: C10010679), Sri Lanka.

Scleria oryzoides J.Presl & C.Presl (1828) 201. — Type: *Haenke* s.n. (lectotype designated here: PRC450374; isolectotypes HAL0063378, K000291177, W n.v.), Philippines, Luzon.

Scleria coriacea G.Bertol. (1854) 476, nom. illeg. — *Scleria bertoloni* M.Martens (1857) 570. — Type: *Bertoloni* s.n. (isotype P00465995), Mozambique, 1842.

Perennial, aquatic with strong rhizome. *Culm* 1.3–2 m by 3–10 mm, glabrous. *Leaves* 40–70 by 1–3 cm, glabrous to scabrid; sheaths glabrous; contraligule truncated. *Inflorescence* a single terminal panicle, densely branched, 10–20 by 5–10 cm; sometimes small lateral panicles present. *Spikelets* unisexual or subandrogynous; glumes 3–4.5 mm long, brown, dark. *Nutlet* 3–3.5 by 2–2.5 mm, ovoid, smooth, white.

Distribution — Eastern Africa, Southern Africa, Madagascar, Asia and Australia. It has become a weed in Australia, Thailand, Vietnam and Indonesia, where it grows in swamps, wet grasslands and in croplands (Holm et al. 1979, Simpson & Inglis 2001, Naczi & Ford 2008).

Habitat & Ecology — In Madagascar, it occurs along the east coast, at sea level.

Conservation — *Scleria poiformis* is widely distributed in Eastern Africa, Southern Africa, Madagascar, Asia and Australia, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Fianarantsoa, Jan. 1964, *J. Bosser* 19017 (MO, P01888489, TAN); Toamasina, environs de Tamatave, 10 Jan. 1933, *Decary* s.n. (P01888488); environs de Tamatave, 27 Nov. 1912, *R. Viguier* & *H. Humbert* 431 (P01888485); Vatmandry, Nov. 1921, *H. Perrier de la Bâthie* 14102 (P01888484, TAN).

Note — It is used in West Africa, for polishing wood and to reduce abdominal inflammation (Burkill 1985). The name that appears in the protologue is *S. poaeformis*; however, its spelling has been revised to *S. poiformis* (Govaerts et al. 2019, IPNI 2018).

Scleria (subg. *Scleria*) sect. *Acriulus* (Ridl.) R.W.Haines & Lye

11. *Scleria greigiifolia* (Ridl.) C.B.Clarke

Scleria greigiifolia (Ridl.) C.B.Clarke (1902) 509. — *Acriulus greigiifolius* Ridl. (1883) 336. — Type: *Welwitsch* 6959 (lectotype designated here: BM000922708), Angola, Huilla, marshes on the river Cacolar, near lake Iwantala, Feb. 1860.

Acriulus madagascariensis Ridl. (1883) 336. — *Scleria acriulus* C.B.Clarke (1902) 509. — Type: *Hildebrandt* 3751 (lectotype designated here: BM000922716; isolectotype K000363343), Madagascar, Andrangaloaka, East Imarina, Nov. 1880.

Acriulus titan C.B.Clarke (1908) 62. — Type: *Gentil* s.n. (lectotype designated here: BR0000008638557), Democratic Republic of Congo, Vallée de la Djuma, July 1902.

Scleria friesii Kük. (1921a) 9. — Type: *Fries* 743 (holotype UPS), Zambia.

Perennial with a thick rhizome. *Culm* 0.75–1.5 m by 3–8 mm. *Leaves* 25–40 cm by 5–8 mm, scabridous to glabrous; basal leaves persistent; antrorse hairs present on margins and central nerve, up to 0.5 mm long; sheath closed, V-shaped, partially membranous; contraligule absent. *Inflorescence* of truncated panicles (Fig. 1e), terminal and lateral, several per node, secondary branches very short; peduncles up to 20 cm, flexuous, reddish. *Spikelets* unisexual or subandrogynous; rachilla purple, dentate; glumes densely ciliate on the inner surface, male 3–4 mm, female 4.5–5 mm, purple on the lower half, straw-coloured at the top, margin finely ciliate. *Nutlet* 4–4.5 by 2–3 mm diam, beaked, smooth, white; hypogynium present, margin revolute, embracing the stipe, red dotted.

Distribution — Tropical and southern Africa, Madagascar.

Habitat & Ecology — In Madagascar, occurring on the grasslands and the mixed woodland grasslands of the Central High Plateau, alt. 1300–1700 m.

Vernacular name — Malagasy: vendrana.

Conservation — Least Concern (Thacker & Juffe Bignoli 2013).

Additional specimens. MADAGASCAR, Dec. 1958, *J. Bosser* 12395 (K000455296); Antananarivo, 17 Jan.–22 Apr. 1955, *H. Humbert* 28167 (MO, P01921102, TAN); Andrangoloaka, Ost-Imerina, Nov. 1880, *J.M. Hildebrandt* 3751 (K000363343); Ankaratra, Lac Froid, 1650 m, 24 Apr. 2010, *I. Larri-don et al.* 2010-0336 (GENT, K); near Carion, Mar. 1961, *J. Bosser* 15031 (K000455295, P01896547); Central, Oct. 1882, *R. Baron* 1870 (K000363344); *ibid.*, Dec. 1883, *R. Baron* 3331 (K000455294); *ibid.*, Nov. 1885, *R. Baron* 4102 (K000455293); Fianarantsoa, near Ambatofinandrahana, 1400–1500 m, 16 Jan. 1955, *H. Humbert* & *R. Capuron* 28123 (K, MO, P01896548); Ambo-sitra, 3 Dec. 1995, *M. Desfayes* 95.3121 (GENT); RN 7, 113–116 km N of Fianarantsoa, 1580–1590 m, 28 Jan. 1975, *T.B. Croat* 29973 (MO, P01896564); West Itremo, 17 Jan.–22 Apr. 1955, *H. Humbert* 30062 (P01896546).

Note — *Scleria greigiifolia* is often misspelled. Kern (1963) commented on the origin of this issue. In Madagascar, a preparation from the leaves is drunk to treat fevers (Rasoanaivo et al. 1992).

Scleria (subg. *Scleria*) sect. *Melanomphalae* Bauters in Taxon 65(3): 461

12. *Scleria melanomphala* Kunth

Scleria melanomphala Kunth (1837) 345. — Type: *Drège* 4379 (lectotype designated here: K000363499; isolectotypes P00465985, P00465986), South Africa, Eastern Cape, between the Bashee river and Morley, 300–600 m, Feb. 1840.

Scleria melanocephala Drège (1843) 147, nom. inval. based on: *Drège* 19 (HAL0063383), South Africa.

Scleria macrantha Boeckeler, nom. illeg. (1879) 572. — Type: *Schweinfurth* 3746 (lectotype designated here: K000321074; isolectotype B†), Sudan.
Scleria melanomphala f. *oculo-albo* C.B. Clarke (1900b) 59. — Type: *Gillet* 321 (not located), Democratic Republic of Congo, Kisantu, 1899.

Scleria longigluma Kük. (1921b) 22. — Type: *Ule* 8066 (lectotype designated here: B100296703, isolectotypes K000584481, K000584482, L0819883, NY00051758, NY00051795), Brazil, Amazonas, Rio Branco, Parime, auf Sumpfcampo bei der Serra de Paracaima, Nov. 1909.

Scleria centralis Cherm. (1931) 50. — Type: not located.

Scleria tisserantii Cherm. (1931) 50. — Type: *Tisserant* 2692 (lectotype designated here: P00466029; isolectotypes BR0000005572144, IFAN31813, P00466030, P00466031), Central African Republic, Région de Bambari, Yanguya, 50 km SE of Bambari, 21 Sept. 1928.

Perennial with well-developed rhizome, 4–6 mm thick; tufted, many leaves and stems with hairy margins and edges persist. *Culm* 0.5–1.3 m by 1–2 mm, edges pilose at the base. *Leaves* 25–35 by 0.3–0.5 cm, margin ciliate at the proximal part (1 mm); contraligule truncated, obtuse, slightly membranous on the margin, glabrous or ciliate. *Inflorescence* a truncated panicle (Fig. 1d), in terminal and lateral positions, sometimes more than one per node; bracts 2–3 cm long, shorter than the inflorescence, straw-coloured or purplish; peduncles 2–15 cm. *Spikelets* unisexual or subandrogynous; glumes 0.8–1.2 cm long, mucronate, glabrous inside and hairy on the external side, purplish with a green brownish midrib. *Nutlet* 3–3.5 by 2–2.5 mm diam, ovoid to elliptic, smooth, apex dark; hypogynium with lobes barely marked, yellowish brown.

Distribution — Africa, South America and Madagascar, in open wet places (Simpson & Inglis 2001).

Habitat & Ecology — In Central Madagascar, alt. 900–1700 m.

Conservation — *Scleria melanomphala* is widely distributed in Africa, South America and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, *Herbier du Jardin Botanique de Tananarive* 331.9 (P01888503); *ibid.*, *Herbier du Jardin Botanique de Tananarive* 331.10 (P01888505); Antananarivo, 16 Mar. 1930, *R. Decary* 7590 (P01784488, TAN); Ambotolampy, 14 Feb. 1930, *J. Peltier & M. Peltier* 1875 (P01888511); Antsirabe, Vontovorona, 2020–2050 m, 1 Apr. 1971, *K.A. Lye* 5945 (K); Manankazo, Ankazobe, 9 Jan. 1913, *H. Perrier de la Bâthie* 2692 (P01888513); Ankaratra, Lake Froid, 1650 m, 24 Apr. 2010, *I. Larridon et al.* 2010-0336B (GENT); Mandraka Forest, Aug. 1906, *Herbier de Ch. d'Alleizette* 1013 (P01888507); Mandraka Forest, 16 Aug. 1906, *Herbier L. Rotureau s.n.* (P01888510); Soamahamania, 1200 m, 3 Feb. 2000, *A. Reynal-Roques et al.* 24936 (MO, P01888500, TAN); Central Madagascar, Betsileo, Jan. 1881, *J.M. Hildebrandt* 4015 (K, P01888508); Oct. 1882, *R. Baron* 2007 (K, P01888499); Fianarantsoa: 14 km au sud de Fianarantsoa, 22 Oct. 1970, *M. Keraudren-Aymonin & G.G. Aymonin* 25103 (P01888509); near Ambatofinandrahana (Betsileo), 1400–1500 m, 16 Jan. 1955, *H. Humbert & R. Capuron* 28118 (P01888498); West Itremo, 1500–1700 m, 17–22 Jan. –18–22 Apr. 1955, *H. Humbert* 300?2 (P01888502); *ibid.*, *H. Humbert* 28168 (P01888504).

Note — This species was identified in Middle Stone Age settlements in South Africa along with *S. natalensis* Boeckeler ex C.B. Clarke, used for bedding (Wadley et al. 2011). Burkill (1985) recorded its use as treatment for disorders of the urinary system.

Scleria (subg. *Scleria*) sect. *Hymenolytrum* (Schrud. ex Nees) Core in Brittonia 2 (1936) 10

13. *Scleria boivinii* Steud.

Scleria boivinii Steud. (1855) 173. — Type: *Boivin* 1643 (lectotype P04021507; isolectotype K), Madagascar, Toamasina, Sainte Marie, Lafondrou Forest (Tafondro), 1849.

Scleria barteri Boeckeler (1874) 504. — Type: *Barter* 1786 (lectotype designated here: K000363314; isolectotypes S-G-9586, TCD0000355), Nigeria, Onitsha.

Perennial climber, tufted at the base. *Culm* 2–10 m by 1.5–2 mm thick, triquetrous, bulbous at the base. *Leaves* 30–35 cm by 2–3 mm, glabrous except main vein villous; hairs present in margins and central costa of the leaf, antrorse along the distal part, the rest retrorse; sheaths puberulent on the abaxial side; contraligule large, obtuse, membranous at the margin, ciliate at the base. *Inflorescence* with conspicuous leafy bracts; terminal and lateral panicles pyramidal, erect, 6–10 cm long, grouped at the top of the culm. *Spikelets* unisexual or subandrogynous; spikelet bract 1–1.5 times longer than the spikelet; glumes bearing the male flower 3–4.5 mm, female 4.5–6 mm, brown, glabrous, midrib scabrid and purplish, rest straw-coloured; staminal crest well developed, up to 1 mm. *Nutlet* 2.5–3.5 by 1.5–2.5 mm, trigonous, minutely hairy, white; hypogynium cream-coloured, rotund, margin revolute, brown.

Distribution — Tropical Africa, Madagascar and the Comoros. This species is recorded as invasive in Ghana (Holm et al. 1979).

Habitat & Ecology — In Madagascar, it is very common and forms dense populations on edges and in canopy gaps of wet forest, alt. 0–2000 m.

Vernacular names — Malagasy: vondranditi, sambi havitra, filelatra, diti.

Conservation — *Scleria boivinii* is widely distributed in Tropical Africa, Madagascar and the Comoros, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antsiranana, Reserve Spéciale Monongarivo, Bekolosy, 22 May 1995, *L. Gautier & C. Chatelain* LG2766 (K, MO, P01888433); *ibid.*, 7–12 Dec. 1992, *S. Malcomber et al.* 1975 (K, MO, P01888419); Betsitsika Forest, 149 m, 12 Jan. 2009, *M.Y. Ammann et al.* MYA247 (K); SAVA, 940 m, 15 Jan. 2004, *L. Nusbaumer* 993 (G); Fianarantsoa, 12 km E of Ifanadiana, 600 m, 18 Dec. 1997, *P. Wilkin et al.* 946 (GENT, K, P01888423, TAN); Ambilandrano, 450 m, 9 Jan. 1993, *H. Beentje* 4802 (K, TAN); Soanierana, 100 m, 30 Nov. 1938, *Lam & Meeuse* 5556 (K, P01888425); Toamasina, 10 km south of Foulpointe, 12 Dec. 1984, *L.J. Dorr & L.C. Barnett* 3394 (K, MO, P01888432); Sainte Marie, Lafondrou Forest (Tafondro) 1849, *M. Boivin* 1643 (K, P04021507); Vallée de la Fanjahirana, 19 Sept. 1932, *M.R. Decary* 10647 (K, P01888420); Toliara, Fort-Dauphin, Ivohibe Forest, 386 m, Nov. 2005, *R. Razakamalala et al.* 2476 (K, MO); near Fort-Dauphin, Manantantely Forest, 60–300 m, 22 Nov. 1928, *H. Humbert* 5780 (K, P01888422).

Note — According to morphological and molecular data (Bauters et al. 2016), it is closely related to *Scleria secans*. This has led to many misidentifications. However, *S. boivinii* is an African taxon, whereas *S. secans* only occurs in South America. *Scleria boivinii* is locally used in many ways. Nutlets are used as beads in necklaces in Ghana (Abbiw 1990). In Tropical Africa, macerates and decoctions of leaves and stems are used to ease childbirth (Lebbie & Guries 1995), treat coughs, blennorrhoea, toothache, snakes bites (Burkill 1985), headaches (Betti 2004, Idu et al. 2014) and onchocerciasis (Abondo et al. 1990).

Scleria (subg. *Scleria*) sect. *Foveolidia* Raf. in Bull. Bot. (Geneva) 1 (1830) 219

14. *Scleria achtenii* De Wild.

Scleria achtenii De Wild. (1926) 16. — Type: *Achten* 97B (lectotype designated here: BR0000008638908), Democratic Republic of Congo, Kasai.
Scleria substriatoalveolata De Wild. (1926) 23. — Type: *Vanderyst* 1890 (lectotype BR0000008638915), Democratic Republic of Congo, June 1913.
Scleria subintegriloba De Wild. (1927) 238. — *Scleria achtenii* var. *subintegriloba* (De Wild.) Piérart (1953) 47. — Type: *H. Vanderyst* 2839 (lectotype designated here: BR0000008638397, isolectotype: BR0000008638380), Democratic Republic of Congo, Dec. 1913.

Perennial with reddish rhizome, 6 by 0.3 cm. *Culm* 0.45–0.70 m by 0.7–1.1 mm, slightly swollen at the base. *Leaves* 20–25 by 0.4–0.5 cm, pseudopraemorse, scabrid, with retrorse hairs

along the margin and central nerves; sheath winged, scabrid; contraligule membranous, reddish. *Inflorescence* consisting of reduced, truncated panicles, laterals solitary; peduncles 2–6 cm. *Spikelets* unisexual or subandrogynous; glumes bearing male flowers 4–4.5 mm long, female 4.5–5.5, straw-coloured. *Nutlet* white, pitted, hairy; hypogynium with long lobes, 2–3-fid, white.

Distribution — Tropical and southern Africa, Madagascar.

Habitat — Only one locality in Madagascar, on a sandy embankment in mid altitude evergreen forest, alt. 1127 m.

Conservation — *Scleria achtenii* is widely distributed in Tropical and southern Africa, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Fianarantsoa, Ranomafana National Park, 1127 m, 21 Apr. 2010, I. Larridon et al. 2010-0228B (GENT).

Note — First time cited from Madagascar. The hypogynium of *S. achtenii*, unlike *S. nyasensis* C.B. Clarke, has bifid or trifid lobes and a single inflorescence panicle in each node.

15. *Scleria foliosa* Hochst. ex A. Rich.

Scleria foliosa Hochst. ex A. Rich. (1850) 509. — Type: *Schimper 1232* (lectotype designated here: BM000758637), Ethiopia, Afar, 18 Sept. 1838.

Scleria foliosa var. *major* Oliv. (1875) 169. — Type: not located.

Scleria complanata Boeckeler (1879) 571. — Type: *Schweinfurth 2389* (lectotype designated here: P00465984; isolectotype B†), Central African Republic, Lande der Djur, grosse Seriba-Ghattas, 17 Sept. 1869.

Scleria dumicola Ridl. (1884a) 169. — Type: *Welwitsch 7122* (lectotype designated here: LISU222796; isolectotype LISU222797), Angola, Pungo Andongo, Jan. 1857.

Scleria perrieri Cherm. (1923) 297. — Type: *Perrier de la Bâthie 12704* (lectotype designated here: P00346037, isolectotypes P00346038, P00346039), Madagascar, near Onilahi River (Benenitsa), July 1919.

Annuals with a poorly developed root system. *Culm* 0.35–0.8 m by 2–3 mm. *Leaves* 15–30 cm by 3–4 mm, glabrous, antrorse hairs on the central veins of the distal part, margin scabrid, three conspicuous central nerves, pleated when dried; contraligule rounded, glabrous, margin entire, surface slightly ciliate towards the mouth. *Inflorescence* of terminal and lateral truncated panicles (Fig. 1f), two per node; leafy bracts present, much longer than the inflorescence on the basal panicles, at least as long on the terminal; laterals with a peduncle of 3–15 cm long, longer towards the base. *Spikelets* unisexual or subandrogynous; glumes straw-coloured with green midrib, male 4.5–5 mm long, females 5 by 2.5–3 mm. *Nutlet* ovoid, 3.5 by 2.5 mm, reticulated but smooth towards the distal third, white; hypogynium cream-coloured, loosely attached to the nutlet, trilobed, lobes rounded to orbicular.

Distribution — Tropical and southern Africa, Madagascar.

Habitat & Ecology — In Madagascar, it is found in open forest and grasslands, alt. 500–1300 m.

Conservation — Least Concern (Mani 2011).

Additional specimens. MADAGASCAR, Antananarivo, Mar. 1960, J.M. Bosser 13623 (TAN); *ibid.*, Feb. 1961, J.M. Bosser 14870 (TAN); Fianarantsoa, Apr. 1960, J.M. Bosser 14115 (P01707650, P01707651, P01707652, P01707653, TAN); Mahajanga, Betainkankana, Ankaizina, Mar. 1952, J.M. Bosser 2771 (P01707649); Toamasina, Apr. 1962, J.M. Bosser 15912 (P01707648, TAN); Toliara, Analavelona Forest, 950–1250 m, Mar. 1934, H. Humbert 14233 (K, TAN).

Note — Chermeson (1937) distinguished the only Malagasy specimen of *S. foliosa* included in his revision as *S. perrieri*, based on the faded reticulation of the nutlet and its attached hypogynium. However, the rest of characters are identical to *S. foliosa*. Used as fodder in Sudan (Simpson & Inglis 2001) and as a treatment for gonorrhoea in Tanzania (Burkill 1985).

16. *Scleria hildebrandtii* Boeckeler

Scleria hildebrandtii Boeckeler (1880a) 454. — Type: *Hildebrandt 2044* (lectotype designated here: P00465972; isolectotype P00465973), Kenya, Fessland von Mombassa, Aug. 1877.

Annual with short rhizome, tufted, many basal leaves persistent as scales. *Culm* 40–60 cm by 1.5–2 mm. *Leaves* 15–20 cm by 5–8 mm, glabrous; antrorse hairs present along the margin on the distal half; margin scabrid; sheaths sometimes shortly winged; contraligule truncated, membranous and puberulous on the surface. *Inflorescence* a truncated panicle with leafy bracts; usually two panicles per node; leafy bracts much longer than the inflorescence on the basal panicles, and at least as long in the terminal. *Spikelets* unisexual or subandrogynous; glumes straw-coloured to reddish, 5–5.5 mm long. *Nutlets* 3.5 by 1.7–2 mm, oblong, smooth, although sometimes very slightly pitted, white; hypogynium without conspicuous lobes as the other species, margin obscure with red dots.

Distribution — Eastern coast of Africa and northeastern coast of Madagascar.

Habitat & Ecology — In Madagascar, it is only known from two localities in the province of Mahajanga. It was found on limestone and sandy soils at sea level.

Conservation — *Scleria hildebrandtii* occurs along the eastern coast of Africa and the northeastern coast of Madagascar. There are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Mahajanga, Feb. 1908, H. Perrier de la Bâthie 2485 (P01888605); environs de Marovoray (Boiar), May 1925, H. Perrier de la Bâthie 17252 (K, P01888604, TAN001259).

Note — It has been confused with specimens of *S. foliosa* with smooth nutlets. However, the nutlets of *S. hildebrandtii* are cylindrical to oblong, whereas *S. foliosa* has an ovoid nutlet that is slightly apiculate.

17. *Scleria lagoensis* Boeckeler

Scleria lagoensis Boeckeler (1869) 151. — Type: *Warming 494* (lectotype designated here: C10010663), Brazil, Lagoa Santa, 2 Mar. 1864.

Scleria moritziana Boeckeler (1874) 460. — Type: *Moritz 645b* (lectotype designated here: BM000598740), Venezuela, Caripe, 1865. The other specimen at BM (BM000598720) is a remaining syntype, because although it is also indicated as *Moritz 645b*, it was collected in Colombia.

Scleria canaliculatotriquetra Boeckeler (1879) 573. — *Scleria lagoensis* subsp. *canaliculatotriquetra* (Boeckeler) Lye (1983) 243. — Type: *Schweinfurth 2474* (lectotype designated here: K000321072; isolectotype B†, P00465981, S-G-9585), Sudan, Djur, Seriba Ghattas, 12 Oct. 1869.

Scleria diurensis Boeckeler (1879) 573. — Type: *Schweinfurth 2389* (lectotype designated here: K000321073; isolectotype B†, P00465982, P00465983), Sudan, Lande der Djur, grosse Seriba-Ghattas, 17 Sept. 1869.

Scleria cervina Ridl. (1884a) 171. — Type: *Welwitsch 7127* (lectotype designated here: BM000798943; isolectotypes LISU222806, LISU222807), Angola, Pungo Andongo, Mar. 1857.

Scleria mayottensis C.B. Clarke (1908) 92. — Type: *Boivin 3043* (isotype P00196802), Mayotte.

Scleria vanderystii De Wild. (1926) 25. — Type: *Vanderyst 3471* (lectotype designated here: BR0000008638601; isolectotype BR00000086385983), Democratic Republic Congo, Feb. 1914.

Scleria canaliculatotriquetra var. *clarkeana* Piérart (1953) 49. — Type: *Mul-lenders 159* (lectotype designated here: BR0000008638625; isolectotype YBI196456948), Democratic Republic of Congo, 10 Mar. 1947.

Perennial. *Culm* 0.8–1 m by 1–2 mm thick, distinctly triquetrous. *Leaves* 40–60 by 0.4–1 cm, glabrous but hairs present on the distal part; sheaths markedly winged; contraligule rounded, membranous, veins well marked, glabrous, with red dots. *Inflorescence* consisting of terminal and lateral truncated panicles, 6–8 cm long. *Spikelets* unisexual or subandrogynous; glumes straw-coloured. *Nutlets* 2.5–3.5 by 1.8–2.2 mm, subtly pitted, hairy underneath, ovoid; hypogynium with three slender lobes, sometimes red at the tip.

Distribution — Tropical and southern Africa, South America and Madagascar.

Habitat & Ecology — Widespread in Madagascar, occurring in evergreen and dry forests, in northern and in central Madagascar, from low altitude to 1300 m. Tolerant to dry soils.

Vernacular name — Malagasy: zamana.

Conservation — *Scleria lagoensis* is widely distributed in Tropical and southern Africa, South America and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Jan. 1899, *H. Perrier de la Bâthie* 883 (K, P01888566); Antananarivo, Mar. 1960, *J.M. Bosser* 13620 (TAN); *ibid.*, 18 Mar. 1951, *H. Humbert & R. Capuron* 25622 (MO); Andraisoro, 11 Mar. 1919, *R. Decary s.n.* (P01888559); Antsiranana, Bemarivo, Boina, Feb. 1907, *H. Perrier de la Bâthie* 2408 (P01888555); Nosy Be, *Boivin* 1990; Mahajanga, Tsaramandroso, 12 Mar. 1965, *Jacqueline & Maurice Peltier* 5209 (P01888552); Toliara, Analavelona Forest, 950–1250 m, Mar. 1934, *H. Humbert* 14233 (MNHN-P1888560).

Note — Vegetative parts of African and American specimens are practically identical. However, nutlets of plants from Brazil (where the type comes from) are frequently hairy all over and more globose than its African relatives. They could be different species or subspecies, as previously noted by Robinson (1966). Nevertheless, further research is required.

18. *Scleria tessellata* Willd.

Scleria tessellata Willd. (1805) 315. — Type: *Willdenow* 17323 (lectotype designated here: B-W17323-010), India.

Tufted annual, completely glabrous. *Culm* 30–80 cm. *Leaves* 10–20 cm by 3–4 mm; antrorse hairs present in the distal part of the leaf; contraligule truncated, membranous, glabrous, red dotted. *Inflorescence* of terminal and lateral truncated panicles; laterals solitary. *Spikelets* unisexual or subandrogynous; glumes 5–6 mm long, straw-coloured; male flowers with two stamens. *Nutlets* oblong, 3–3.5 by 1.5–2 mm, regularly tessellate, white; hypogynium strongly trilobed, loosely appressed to the nutlet, yellowish brown.

Distribution — Tropical Africa, Madagascar, Australia, India and South East Asia.

Habitat & Ecology — Very common in wetlands, grasslands and rice fields (Naczi & Ford 2008). Only two localities known in Madagascar. In Madagascar, its distribution area overlaps with *S. hildebrandtii*. On wet and sandy grassland, at sea level. Chermezon (1937) suggested it was introduced in Madagascar.

Conservation — *Scleria tessellata* is widely distributed in Tropical Africa, Madagascar, Australia, India and South East Asia, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Mahajanga, near Majunga, Apr. 1908, *H. Perrier de la Bâthie* 2595 (K, P01888413, P01888414); *ibid.*, Mar. 1927, *H. Perrier de la Bâthie* 17945 (K, TAN001257).

Note — Kühn (1982) noted that this taxon originated from Madagascar, a statement totally unfounded. *Scleria tessellata* resembles *S. hildebrandtii* and *S. foliosa*. *Scleria tessellata* can be distinguished because of the oblong and reticulate nutlet, and the deeply trilobed hypogynium, lobes are oblong. The pits of *S. tessellata* are not as deep as in *S. foliosa*. It has also been misidentified as *S. bambariensis* Cherm. However, there is no evidence that *S. bambariensis* occurs in Madagascar. This misunderstanding is probably due to the incorrect identification of *Perrier de la Bâthie* 17945 (K) as *S. bambariensis* by E.A. Robinson.

Scleria (subg. *Scleria*) sect. *Elatae* C.B. Clarke in Hook., Fl. Brit. India 6 (1894) 689

19. *Scleria rutenbergiana* Boeckeler

Scleria rutenbergiana Boeckeler (1880b) 40. — Type: *Rutenberg s.n.* (lectotype designated here: BRNU 347461!), Madagascar, Antsiranana, Im Gehölz von Luku bé (Nossi-bé), Apr. 1878.

Perennial rhizomatous. *Culm* 1–2 m by 2–3 mm, glabrous, scabridous along the edges, reddish. *Leaves* 20–30 cm by 1.2–1.5 mm, pseudopraemorse, glabrous, margin entire to scabridous; contraligule triangular, apex rounded, glabrous. *Inflorescence* consisting of panicles in lateral and terminal position, 5–15 cm long, lax; lateral panicles usually less than 5 cm long, the most basal isolated; bracts leafy. *Spikelets* unisexual or subandrogynous; rachilla reddish, scabrid; bracts ciliate at the base, up to 2 cm long; glumes 3 mm, straw-coloured. *Nutlet* 2.5–3 mm diam, globose to ovoid, white, smooth; hypogynium trilobed, lobes truncated, yellowish brown (Fig. 2k–l).

Distribution — Endemic to Madagascar.

Habitat & Ecology — In Madagascar, most frequently along the eastern and north-western coasts, alt. 0–1200 m.

Conservation — *Scleria rutenbergiana* is a widespread species, endemic to Madagascar, occurring in the North Western and Eastern parts of Madagascar. This species is found in Analamazaotra, Betampona, Isalo, Lokobe, Manongarivo and Montagne d'Ambre protected areas. Using all records, the estimated extent of occurrence (EOO) is 193 379 km² which exceeds the value of any threatened category. However, the area of occupancy (AOO) is 44 km² which is smaller than 2 000 km² and meets the threshold of Vulnerable, and its number of locations nearly meets the threshold for Vulnerable (11 > 10). Hence, it is here assessed as Near Threatened.

Additional specimens. MADAGASCAR, Tsivendrambendrana, R.N.70, Z. 27 (P01888460, P0188846, P01888461, P01888462); Antsiranana, Nossibe, Dec. 1857, *Boivin s.n.* (P01888464); P.N. Montagne d'Ambre, 1400–1475 m, 9–13 Apr. 1993, *S. Malcomber et al.* 2371 (K, MO); Fianarantsoa, km 23 R.N.25 Mananjary-Ifanadiana, 30 m, 16 Dec. 1997, *P. Wilkin et al.* 941B (P01888458); Analamazaotra, 1908, *d'Alleizette s.n.* (P01888447); Tananarive, Fotsimano, Dec. 1962, *J. Bosser* 17028 (P01888449); Toamasina, Mar. 1954, *J. Bosser* 163 (P01888450); near Toamasina, 20 Sept. 1912, *R. Viguier & H. Humbert* 195 (P01888454, P01888455); Ste. Marie, May 1847, *M. Boivin* 1645B (P01888445).

Note — Our morphological study agrees with both Chermezon (1937) and Bauters et al. (2016) that *S. rutenbergiana* appears to be related to certain species in sect. *Elatae*, such as *S. terrestris*. However, sect. *Elatae* only occurs in Asia and Oceania, except for *S. sumatrensis*, which has been recorded from the Seychelles, but is very different from *S. rutenbergiana*. Alternatively, *S. rutenbergiana* may belong to sect. *Abortivae* because of the heart-shaped hypogynium. This would provide a more parsimonious explanation since *S. rutenbergiana* occurs in the same place where sect. *Abortivae* diversified. A molecular study is needed to confirm the placement of this species.

Scleria (subg. *Scleria*) sect. *Abortivae* Cherm. ex Bauters

20. *Scleria angusta* Nees ex Kunth

Scleria angusta Nees ex Kunth (1837) 346. — Type: *Drège* 4246 (lectotype designated here: P00462002; isoelectotypes P00462000, P00462001, K000363518, K000363519), Madagascar, Cap. b. Spei., 1 Mar. 1832. *Scleria angustata* Steud. (1841) 542. — Type: not located.

Perennial. *Culm* 1–2.5 m by 3–4 mm, triangular, mainly glabrous, sheath occasionally puberulent. *Leaves* 30–40 by 1.2–2 cm, largely acuminate, pleated when pressed, pseudopraemorse. Medium leaves closely arranged, sheaths completely covering the culm; antrorse-hairs usually present along

margins and distal third of the central nerves on the abaxial side; contraligule triangular, rounded, puberulous, purplish. *Inflorescence* a panicle with leafy bracts, pyramidal, terminal, 7–12 cm long, laterals solitary and at least the most basal shorter than the internode (Fig. 1c); peduncle only visible in the basal panicles, generally less than 5 cm long. *Spikelets* unisexual or subandrogynous; rachilla pale brown to greenish, sometimes reddish, flattened; prophyll, rachilla and bracts of the spikelet glabrous, sometimes hairy; glume bearing male flower 3–4 mm long, female 3 mm, shortly mucronate, straw-coloured, mucronate, ciliate at the base. *Nutlet* ovoid to piriform, 2–2.5 mm long, 1.5–2 mm diam, white to purple, smooth, shiny; hypogynium heart-shaped, lacinate, especially on the lobes (Fig. 2m–n).

Distribution — South Africa and Madagascar. South Africa: patchy distribution along the coast of Natal. Madagascar: along the east coast, and more rarely in the Central region.

Habitat & Ecology — In swamp forest (Gordon-Gray 1995), in wetlands, more rarely close to rivers and lakes, alt. 0–1000 m.

Conservation — *Scleria angusta* is native to Madagascar and found also in South Africa. This is a widespread species, which is found in the Mananara Nord and Isalo protected areas. The estimated of EOO is much larger than the threshold for a threatened category. Furthermore, there are no major threats which affect this species. Hence, it is assessed as Least Concern.

Additional specimens. MADAGASCAR, L'Ouest de l'Isalo, 30 July 1928, *H. Humbert* 5055 (K, P0189809, TAN001250); *ibid.*, 700–800 m, Mar. 1934, *H. Humbert* 13750 (P01898854); Antananarivo, Oct. 1882, *R. Baron* 1435 (K, P01707789); Antsiranana, Daraina, Antsahabe Forest, 550 m, 11 Jan. 2004, *L. Nusbaumer* LN916 (K); Toamasina, Tamatave, 26 July 1912, *K. Afzelius* s.n. (K); Toliara, Tôlanaro, Ste. Luce, 10 m, 20 Oct. 1989, *R. Rabehovitra* 2062 (K, MO); Soomierana, 10 Oct. 1932, *R. Decary* 10768 (K).

Note — The niche of this species is the same in Madagascar and South Africa. Therefore, it probably diversified in Madagascar, along with the rest of *Abortivae* group, and dispersed to South Africa.

21. *Scleria baronii* C.B. Clarke

Scleria baronii C.B. Clarke (1895) 669. — Type: *Baron* 4296 (lectotype designated here: K000363341; islectotype P00457088), Madagascar, Antananarivo, 1889.

Perennial with a robust rhizome. *Culm* 1–2.5 m by 5–6 mm. *Leaves* 30–40 by 2.5 cm, pseudopraemorse, glabrous; contraligule triangular, puberulous on the surface, margin membranous and reddish, inner nerves curved outwards following the margin. *Inflorescence* with leafy bracts, lateral panicles always solitary at the nodes; panicles lax, copiously branched, basal secondary branches over 4 cm long; laterals 10–12 cm long; peduncles 3 cm, longer than the internodes. *Spikelets* unisexual or subandrogynous; glumes 3–4 mm long, dark purple, female mucronate, glabrous, prophyll puberulous. *Nutlet* ovoid, 2.5–3 mm long, 2–2.5 mm diam, white to purplish, smooth, shiny; hypogynium very reduced, cupule very thick and dark (Fig. 2e).

Distribution — Endemic to Madagascar.

Habitat & Ecology — Mid and low altitude evergreen forests, alt. 500–1600 m.

Conservation — Although endemic to Madagascar, *Scleria baronii* is a widespread species. It occurs within protected areas such as Ambohitantely and Andohahela. Since there are no specific threats which affect this species, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antananarivo, 1889, *R. Baron* 4296 (K000363341, P00457088); Antsiranana, Diana, 500 m, *H. Perrier de la Bâthie* 2632 (P00457087); Fianarantsoa, Ambohitombo Forest, Jan. 1895, *Forsyth Major* 205 (K); Ivohibe, Marovitsika Forest, 17 Oct. 2000, *P. Hoffman et al.* 221 (K, P01898846); Toamasina, 11 Dec. 1958, *Réserves Naturelles*

9632 (P01896595, P01896596); Alaotra-Mangoro, 987 m, 14 Feb. 2007, *P. Antilahimena* 5872 (MO, P01708459, TAN); Alaotra-Mangoro, 993 m, 14 Feb. 2007, *P. Antilahimena* 5349 (MO, P01670451, TAN); Toamasina, 900 m, Sept. 1953, *J.M. Bosser* 6569 (P01896592, P020640250); *ibid.*, 900–1200 m, Sept. 1937, *H. Humbert* 18035 (P02640249).

Note — The reduced hypogynium led Chermeson (1937) to place it in sect. *Elatae*.

22. *Scleria madagascariensis* Boeckeler

Scleria madagascariensis Boeckeler (1884) 514. — Type: *Hildebrandt* 3745 (lectotype designated here: K00363342; islectotypes P00457089, P00457090), Madagascar, Antananarivo, Ost-Imerina, Andrangoloaka, Nov. 1880.

Perennial with conspicuous rhizome. *Culm* 1.5–2 m by 2.5–3.5 mm, triquetrous, scabridulous, edges red. *Leaves* 20–30 by 1.2–1.4 cm, pseudopraemorse, arranged every 10 cm along the culm; leaf sheaths glabrous or puberulous, winged; hairs present all along the margin and wings, retrorse, reddish, antrorse along the veins, only in the apical part, scarce; contraligule triangular, rounded, margin red, membranous. *Inflorescence* red, with leafy bracts; internodes red; panicles pyramidal, one terminal plus 3–4 laterals, 8–13 cm long, each lateral as long as the internode, the basal pedunculate. *Spikelets* unisexual or subandrogynous; bracts conspicuous, 2–6 cm long; prophyll purple, puberulous; glumes 3–4 mm long, slightly mucronate, reddish, finely ciliate along the margin and hairy at the base. *Nutlet* 3–3.5 by 2–2.5 mm, ovate, smooth, white, apex purplish; hypogynium trilobed, dentate, white with red dots (Fig. 2a–b).

Distribution — Endemic to Madagascar. Only known from four localities.

Habitat & Ecology — Evergreen forest, alt. 1200–1400 m.

Conservation — *Scleria madagascariensis* is endemic and is found only in the Central Highlands of Madagascar. It is known from two locations. The estimated of EOO (170 km²) and AOO (12 km²) do not exceed the value of the Endangered category. This species and its habitat are threatened by fire, illegal logging, deforestation for charcoal production and marketing and shifting agriculture (Ravonarijaona 2010). Therefore, it is assessed as Endangered under the criterion B1ab(ii,iii,v)+2ab(ii,iii,v).

Additional specimens. MADAGASCAR, Antananarivo, Anjozorabe Forest, 1400 m, 3 Sept. 1991, *A. Rokotozafy et al.* 2741 (K, MO); Ost-Imerina, Andrangoloaka, Nov. 1880, *J.M. Hildebrandt* 3745 (K000363342); Central, Oct. 1881, *R. Baron* 452 (K).

Note — There are many misidentifications between *S. madagascariensis* and *S. rosea*. However, *S. madagascariensis* is a very rare species that always shows winged sheaths, reddish glumes, spikelets with long bracts and a dentate hypogynium.

23. *Scleria rosea* Cherm.

Scleria rosea Cherm. (1923) 298. — *Scleria trialata* var. *rosea* (Cherm.) Cherm. (1927 '1928') 608. — Type: *Viguier & Humbert* 574 (lectotype designated here: P00457097; islectotype B100166745), Madagascar, Andorovanto, Anivorano, 8 Oct. 1912.

Perennial, rhizome well lignified. *Culm* 0.8–1.5 m by 2–3.5 mm, triquetrous, scabridulous, reddish. *Leaves* 15–25 by 1–1.4 cm, glabrous but puberulous towards the mouth, pseudopraemorse; sheaths sometimes winged; margin and distal part of the veins scabrid, reddish; contraligule triangular, apex rounded, margin dark, ciliate. *Inflorescence* with terminal and lateral panicles subtended by leafy bracts; panicles pyramidal to spiciform (Fig. 1a); peduncles very short, almost entirely inside the sheath; laterals shorter than the internodes, solitary. *Spikelets* unisexual or subandrogynous; rachilla reddish; prophyll purple, puberulous; glumes 2–3.5 mm long, shortly mucronate, straw-coloured

to dark purple/reddish, margin ciliate. *Nutlet* ovoid, 2.5–3 by 1.5–2 mm, white, smooth; hypogynium heart-shaped, white, lacinate (Fig. 2g–h).

Distribution — Endemic to Madagascar.

Habitat & Ecology — In littoral to mid altitude evergreen forests, alt. 0–900 m.

Vernacular names — Malagasy: vendranala, lamiera.

Conservation — *Scleria rosea* is endemic to Madagascar and widespread in the Eastern evergreen forest. There are no specific threats known which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antsiranana, Ambahatra, 800 m, 3 Mar. 1999, L. Gautier et al. LG3457 (GENT, K, P01888410); Ambre Mount, 850 m, 29 Mar. 2012, S.D. Ramandimbomanana et al. SDR460 (GENT, K); Bekolosy, 850 m, 20 May 1995, L. Gautier & C. Chatelain LG2737 (K, P01888409); Daraina, 800 m, 3 Dec. 2004, L. Gautier & R. Claude LG4821 (GENT, K, P01708460); ibid., 400 m, 4 May 2010, C. Birkinshaw et al. 1769 (K, MO); Fianarantsoa, Ivohimonitra Forest, 1896, Forsyth Major 90 (K); Manombo, 20 m, 20 Sept. 2005, R. Razakamalala et al. 2175 (K, MO); R. Razakamalala et al. 776 (MO, P01888402); Toamasina, Maroantsetra, 100–200 m, 1 Nov. 2001, O. Poncy 1549 (K, P00373065); Maroantsetra, 4 m, 5 Sept. 2009, H. Ralimanana RL11285 (K); Mangerivola, 491 m, 23 July 2006, T. Ranarivelo et al. RT1282 (K); Toliara, Anosy, 0–10 m, 29 Apr. 1989, R.E. Gereau et al. 3434 (K, MO, P01888401); Manantanteli Forest, 60–300 m, 22 Sept. 1928, H. Humbert 5820 (K, P01888400).

Note — Many *Scleria* specimens found in the Seychelles and the Mascarenes have been identified as *S. sieberi* Nees. However, the status of this taxon is uncertain since Nees (1834: 303) confusingly published two names on the same page with the same epithet, i.e., *Scleria sieberi* Nees (no specimen indicated) and *Hypoporum* (now accepted as *Scleria*) *sieberi* Nees (based on *Sieber Agrostotheca* 97 which is a specimen of *Scleria lithosperma*). Kunth (1837: 346) validated *Scleria sieberi* Kunth and indicated a specimen (*Sieber Agrostotheca* 141). *Scleria sieberi* sensu Clarke (as indicated on the herbarium specimens: J. Home 636, K000363347; J. Home 642, K000363348) is closely related to, and possibly the same species as, *S. rosea* bearing largely acuminate leaves, white to purple nutlets with a lacinate hypogynium, spikelets with conspicuous bracts and inflorescences with a reddish rachilla and straw-coloured glumes. If both taxa are merged, the name *S. sieberi* has priority over *S. rosea*. However, the relationship between these species needs further investigation including examination of additional collections from the Seychelles and Mauritius.

24. *Scleria trialata* Poir.

Scleria trialata Poir. (1806) 6. — Type: *du Petit-Thouars s.n.* (lectotype designated here: P00457082; isolectotype P00457083), Madagascar.

Scleria abortiva Nees ex Kunth (1837) 346. — Type: *Goudot s.n.* (lectotype designated here: P00457085), Madagascar. The other specimen at P (P00457084) is a remaining syntype (Herb. Maire instead of Herb. Goudot and therefore not part of the same collection).

Scleria abortiva var. *planifolia* Cherm. (1923) 299. — Type: *Perrier de la Bâthie* 2651 (lectotype designated here: P00457086), Madagascar, Nossibé, Lokobe, Aug. 1913.

Perennial. Culm 1.5–2 m by 3–6 mm, triangular, puberulous, soft, with appressed hairs scattered all over specially near the mouth. Leaves 25–35 by 1.4–2 cm, pseudopraemorse, arranged every 5–7 cm; hairs present, antrorse, along the margin and distal part of veins; blade sometimes rough, covered by a dense indumentum of stiff appressed antrorse hairs; leaf sheaths loose, rarely winged, covering the culm almost completely; contraligule triangular, apex rounded, puberulous, margin ciliate, internal veins curved outwards sometimes straight at the mouth. **Inflorescence** conspicuous, densely branched (Fig. 1b); terminal panicle 7–12 cm long; laterals longer than the internode, solitary; peduncles usually less than 3–5 cm,

sometimes covered by the sheath. **Spikelets** unisexual or subandrogynous; rachilla straw-coloured; bracts < 2 cm long, scabrid; prophyll straw-coloured, puberulent; glume bearing the male flower 3.5–4 mm long, female 3–3.5 mm, mucronate, margin entire or finely ciliate; external glumes mainly brownish, purple/red on the margins, internals completely purplish. *Nutlet* ovoid, 2.5–3 by 1.5–2 mm, smooth, white; hypogynium heart-shaped, yellowish brown, lacinate (Fig. 2c–d).

Distribution — Madagascar and the Comoros.

Habitat & Ecology — In Madagascar, it is restricted to the northern and eastern wet forests, alt. 0–1400 m.

Vernacular names — Malagasy: tsivendrambendrana, verdradity.

Conservation — *Scleria trialata* is native to Madagascar and the Comoros. It is found in Andohahela, Masoala, Marojejy, Montagne d'Ambre and Ranomafana protected areas. This is a widespread species and there are no specific threats known which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antananarivo, 950 m, 13 Aug. 1968, J.H. McWhirter 120 (K); Ankazobe, 23 Dec. 1947, M.P. Saboreau 1185 (K); Oct. 1882, R. Baron 1424 (K, P01875262, P01875263); Antsiranana, Doany, 1250 m, 26 Oct. 2001, L. Gautier et al. LG3944 (GENT, K, P01708454); Fianarantsoa, Ranomafana Forest, 1200 m, 29 July 1987, P. Phillipson 2169 (MO); Toamasina, Alaotra-Mangoro, 1085 m, 10 Feb. 2008, A. Rakotondrafara 533 (MO, P01668985, TAN); NW Masoala Peninsula, 550 m, 10 Oct. 1986, P.P. Lowry II et al. 4062 (K, MO); Antaralava Besalamy Forest, 958 m, 15 Nov. 2008, P. Antilahimena et al. 6906 (K, MO); Masoala Peninsula, 0–10 m, June 1993, M.L. Zjhra & J. Hutcheon 238 (K, MO); 470 m, 19 Sept. 1993, K. Lance 30 (K); Moramanga, 900 m, 11 Nov. 1938, Lam & Meeuse 5375 (K); Perinet Reserve, 5 May 1988, D.A. Simpson 88/112 (K); Vavatenina, 300–350 m, 12 July 2003, A. Rakotondrafara et al. 234 (K, MO); Toliara, Andohahela, 200–700 m, 4–24 May 1993, B. Randriamampionona 328 (K, P01875304); Massif de Bezavona, 28 Aug. 1919, R. Decary 10434 (K, MO, P01898905); Pic St Louis, 9 July 1932, R. Decary 9954 (K, MO). — MAYOTTE, Grande-Terre, Mamoudzou, 1 July 2003, F. Barthelat 1204 (K); Reserve Forestiere de Majimbini, 18 June 2002, F. Barthelat 934 (K). — RÉUNION, Sainte-Rose, 300 m, Mar. 1957, J. Bosser 11954 (K).

Note — *Scleria trialata* differs from *S. angusta* in its larger panicles, generally longer than the internodes, dark glumes, and broader scabrid leaves. In Madagascar, it is used to treat toothaches (Chermezon 1937).

Scleria (subg. *Scleria*) sect. *Scleria* P.J.Bergius

25. *Scleria gaertneri* Raddi

Scleria gaertneri Raddi (1823) 331. — Type: *Raddi s.n.* (holotype PI), Brazil, Rio de Janeiro.

Scleria melaleuca Rchb. ex Schltldl. & Cham. (1831) 29. — *Scleria pterota* var. *melaleuca* (Rchb. ex Schltldl. & Cham.) Uittien (1934) 140. — Type: *Weigelt s.n.* (lectotype designated here: G00098565; isolectotypes F0045612F, G00098566, HAL0079367), Surinam, 1827.

Scleria asperata C.Presl (1828) 268, nom. inval., later validly described as *Scleria communis* Kunth. — *Scleria communis* Kunth (1837) 340. — Type: *Sieber Agrostotheca* 100 (lectotype designated here: HAL0082038), Australia, 1823.

Scleria scindens Nees ex Kunth (1837) 343. — *Scleria pterota* C.Presl ex C.B. Clarke (1900a) 146, nom. superfl. — Type: *Sieber* 269 (isotype MO657694 n.v.), Martinique. Note: Presl (1828: 268) cited the type, previously identified as *Scleria latifolia* Sw., as representing a new species *Scleria pterota* C.Presl, nom. inval.

Scleria affinis C.Presl ex Steud. (1841) 542, nom. inval.

Scleria pratensis Lindl. ex Nees (1842) 179. — Type: Nees (1842) 179, t. XXIII.

Scleria conspersa Sellow ex Nees (1842) 179. — Type: Sellow 79 (not located).

Scleria pratensis var. *melanocarpa* Nees (1842) 179. — Type: not located.

Scleria selleana Schrad. ex Nees (1842) 179, nom. inval. in synon.

Scleria simplicior Steud. (1855) 169. — Type: Guyana (not located).

Scleria flagellata Sw. ex Boeckeler (1874) 506, nom. inval. in synon.

Scleria ottonis Boeckeler (1874) 490. — Type: Otto 299 (not located), Cuba.

Scleria longifolia Boeckeler (1882) 30. — Type: *Hildebrandt 2924* (lectotype designated here: K000363352; isolotypes B†, CORD00002145, GOET002940, JE00005191, JE00005192, L0042785, M0107094, P00346042, P00346043, US00087112), Madagascar, Nossi-be, forests near Loucou-be, Apr. 1879.

Scleria pittieri Boeckeler (1896) 159. — Type: *Pittier s.n.* (not located), Costa Rica.

Scleria boliviana Palla (1910) 90, nom. nud.

Scleria congolensis De Wild. (1926) 19. — Type: *Vanderyst 2229* (lectotype BR0000008638939), Democratic Republic Congo.

Scleria pterota var. *submelaleuca* Kük. (1926) 216. — Type: not located.

Perennial, tufted with well-developed rhizome. *Culm* 35–80 cm by 1.3–1.6 mm. *Leaves* 10–30 cm by 5–8 mm, generally glabrous but central vein ciliate, some basal leaves with few but conspicuous hairs, margins scabrid; spine-like hairs present along the distal part of the leaves, antrorse, sheaths slightly winged; contraligule triangular, glabrous, sometimes puberulous, strongly ciliate along the margin. *Inflorescence* with panicles spiciform, little branched, rachilla reddish, flattened, completely glabrous; one or two terminal panicles, up to 5 cm long; laterals solitary, generally two or three, distal panicle close to the terminal, basal much shorter than the internode; peduncles up to 5 cm. *Spikelets* unisexual, mostly 3/4 female; glumes bearing male flowers 2.5–3.5 mm long, female 3–3.5 mm, both straw-coloured with reddish margin and green midrib. *Nutlets* globose, 2–3 mm diam, smooth, hairy underneath, shiny, white; hypogynium deeply trilobed, margin revolute.

Distribution — Africa, Central and South America, and Madagascar. It is as a weed in Peru (Clavo Peralta 1993), Costa Rica, Honduras, Trinidad and Dominican Republic (Holm et al. 1979).

Habitat & Ecology — In Madagascar, coastal to mid altitude wet forest, alt. 0–1200 m.

Vernacular names — Malagasy: vendrmaro, serosera nbambo.

Conservation — *Scleria gaertneri* is widely distributed in Africa, Central and South America and Madagascar, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, Antsiranana, 400 m, 28 May 1995, L. Gautier & C. Chatelain 2829 (MO, TAN); Ankarana Massif, 170 m, 31 Jan. 2003, M. Bardot-Vaucoulon et al. 1385 (K, MO, TAN); Besinkaram, 350 m, 2 Apr. 1996, L. Gautier & S.T. Beck LG2959 (G, K, MO, TAN); Maroantsetra, 28 Feb. 1988, D.A. Simpson 88/87 (K, MO, TAN); Nossibé, Apr. 1879, J.M. Hildebrandt 2924 (JE, K, P01888534); Sava, 1190 m, 3 Mar. 2006, R. Razakamalala et al. 2709 (K, MO); Fianarantsoa, km 23 RN25 Mananjary-Ifanadiana, 30 m, 16 Dec. 2017, P. Wilkin et al. 941 (K); Toamasina, Maroantsetra, Andranofotsy river, 11 Feb. 1988, D.A. Simpson & M. Cheek 88/19 (K, TAN); route Fotsimaro-Ambodiriano, Dec. 1962, J.M. Bosser 17021 (K, TAN).

Note — In a study from Brazil, Silva et al. (2001) noted that *S. gaertneri* establishes arbuscular mycorrhizae in some environments. In South America, it has been utilised as a stimulant of the nervous system and to treat constipation (Alcorn 1984) and snake poisoning (Soares et al. 2004). In Tanzania, it is locally used as a medicine to treat dysmenorrhoea and colds in humans, and rinderpest in cattle (Burkill 1985). *Schoenus latifolius* Vahl (1805: 226) and its nomen novum *Dichromena vahlii* A.Dietr. (1833: 169) based on the type specimen from Puerto Rico is sometimes placed in synonymy. Although the type specimen (C10010674) is not in good condition and therefore difficult to identify with certainty, Camelbeke (2002) considered it to be *Scleria mitis* P.J.Bergius instead.

Scleria (subg. *Scleria*) sect. *Ophryoscleria* (Nees) C.B. Clarke in Urban, Symb. Antill. 2 (in Clarke 1990a) 138

26. *Scleria racemosa* Poir.

Scleria racemosa Poir. (1806) 6. — *Ophryoscleria racemosa* (Poir.) Nees (Nees 1842) 183. — Type: *du Petit-Thouars s.n.* (lectotype designated here: P00346044; isolotype P00346045), Madagascar.

Scleria macrosperma Nees ex Kunth (1837) 344, nom. nud. in synon. based on *Lindley s.n.* — *Scleria macrocarpa* Nees (1842) 183, nom. nud. in synon. based on *Lindley s.n.*

Scleria ciliolata Boeckeler (1882) 31. — Type: *Hildebrandt 2921* (lectotype designated here: K000363350; isolotype: P01888440), Madagascar, Nossibé, in marsh, Apr. 1879.

Scleria racemosa var. *eciliaris* Kük. (1921a) 10. — Type: not located.

Perennial with strong rhizome. *Culm* 1.5–3 m by 4–6 mm. *Leaves* 30–60 by 1.5–3 cm, pseudopraemorse; hairs present along distal third of margins and nerves of the abaxial side, antrorse, conspicuous, up to 0.2 mm; sheath winged; contraligule triangular, glabrous, margin membranous. *Inflorescence* a terminal panicle and several smaller laterals, do not overlap with each other, barely branched. *Spikelets* unisexual or sub-androgynous; glumes bearing male flowers 4–4.5 mm long, female 4–5 mm, straw-coloured outside with brown red dots at the top, purplish inside, puberulous. Spikelet bracts ciliate at the base. *Nutlets* 4.5–5 by 3–4 mm, smooth, beige, style persistent; hypogynium regularly ciliate; cupule swollen, cup-shaped, yellowish brown.

Distribution — Tropical and East Africa, Madagascar, the Comoros and Mayotte.

Habitat & Ecology — Widespread across the wetlands of the northern half of Madagascar. Associated with *Raphia farinifera* (Gaertn.) Hyl., alt. 0–500 m.

Vernacular name — Malagasy: sirosera.

Conservation — *Scleria racemosa* is widely distributed in Tropical and East Africa, Madagascar, the Comoros and Mayotte, and there are no specific threats which affect this species. Therefore, it is here assessed as Least Concern.

Additional specimens. MADAGASCAR, 10 Oct. 1969, B. Descoings 1198 (P01888436); Moquin-Tandon, C.H.B.A. Moquin-Tandon s.n. (P00346045); Antsiranana, Ambilobé, Mahavary, 31 July 1939, R. Decary 14767 (P01888468, TAN); Antsakoamanondro, 17 May 1960, J. Peltier & M. Peltier 2432 (P01888443); Nossibé, 28 Jan. 1841, A. Pervillé 485 (P01888476, P01888477, TAN); ibid., Aug. 1841, A. Pervillé 248 (K); ibid., May 1879, J.M. Hildebrandt 2984 (K000363351, P01888441); ibid., June 1847, M. Boivin 1991 (P01888466, P01888467); ibid., June 1907, L. Rotureau s.n. (P01888444); ibid., J.M.C. Richard 924 (P01888472); Sava, 1190 m, 4 May 2006, R. Razakamalala et al. 2814 (K, MO, P01888437, TAN); Mahajanga, 1932, H. Perrier de la Bâthie 638 (P01888469); ibid., 27 May 1912, K. Afzelius s.n. (K); Ambatoboeny, 125 m, 18 May 2001, R. Randrianaivo et al. 638 (K, MO); Ampijoara, Natural Reserve, 12 Nov. 1995, M. Deshayes 95.12111 (GENT); Ampombimanangy, 113 m, 24 July 2006, M. Andriamahay & S. Rakotoarisoa 1446 (K); Analalava, 15 m, 5 May 2012, S.E. Rakotoarisa & H. Randrianavsoa SNGF3069 (K000753248, MO, P, TAN); Befandriana-Nord, 29 July 1942, *Herbier du Jardin Botanique de Tananarive* 5175 (P01888439); North, Jan. 1892, R. Baron 6371 (K); North-West, Sept. 1887, R. Baron 3787 (K); Toamasina, M. Bojer s.n. (P01888474); Besinkara, 300 m, 23 June 1994, L. Gautier et al. LG2411 (G, MO, P01888465, TAN); Analamazaotra Forest, Oct. 1909, A.C. D'Alleizette 681 (P01888471); Ste. Marie, M. Boivin 1647 (P01888442).

Incertae sedis

Four specimens representing three taxa could not be identified. They may represent new taxa, or aberrant individuals.

1. *Scleria* aff. *woodii*

Perennial. *Rhizome* 2 mm wide. Stems very close to each other, reddish at the base, old sheaths persistent. *Culm* 0.5–0.7 by 0.5–1 mm, triquetrous, slightly bulbous at the base. *Leaves* 15–20 cm by 1–1.5 mm, glabrous, margin entire; contraligule

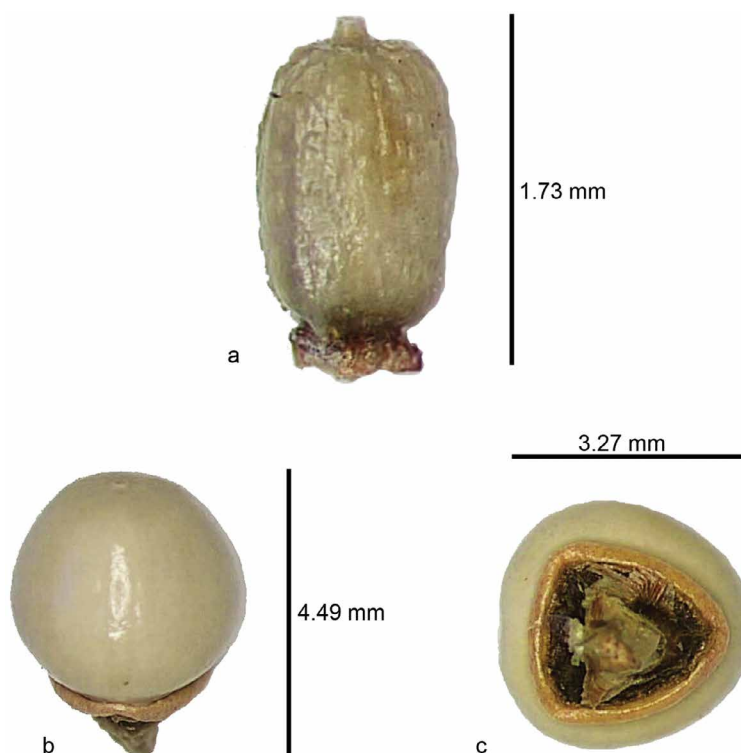


Fig. 5 Nutlets of incertae sedis *Scleria* specimens from Madagascar. a. *S. aff. woodii*; b–c. *S. aff. gaertneri* (a: *H. Humbert & R. Capuron* 28113; b–c: *H. Humbert & R. Capuron* 25909; all K).

truncated, rounded, ciliated, dark red. *Inflorescence* a lax terminal panicle, 10–15 cm long; inflorescence bract slender and as long as the whole panicle; glomerules with 4–5 spikelets, branches up to 3 cm. *Spikelets* androgynous; glumes 4–4.5 mm, glabrous, straw-coloured, not mucronate at all. *Nutlet* 1.5–1.8 by 0.8–0.9 mm, trigonous, elliptic, white, longitudinally wrinkled; hypogynium absent, 3 depressions at the base.

Specimens. MADAGASCAR, Fianarantsoa, Ambatofinandrahana, 1400–1500 m, 17 Jan. 1955, *H. Humbert & R. Capuron* 28113 (K); Toliara, Andrahomana, 1–100 m, 25–26 Feb. 1955, *H. Humbert & R. Capuron* 29119 (K).

Note — There are two specimens available, collected the same year from very distant places. This taxon belongs to a group of subg. *Hypoporum* species (like *S. woodii* C.B. Clarke, *S. rehmannii* C.B. Clarke, *S. paupercula* E.A. Rob.), which are not represented in Madagascar, i.e., species with large inflorescences branched just once and a conspicuous rhizome (Haines & Lye 1983: 334). The nutlet is very distinct, with weak longitudinal wrinkles (Fig. 5a). The nutlets of *S. woodii* are very different.

2. *Scleria* aff. *gaertneri*

Perennial, with many stolons present. *Culms* 70–80 cm by 2–3 mm, old leaves surrounding the base. *Leaves* every 4–6 cm, 25–30 cm by 6–7 mm, villose all over; contraligule rounded, pilose, reddish. *Inflorescence* a lax panicle, with a leafy bract at the base; terminal inflorescence 10–11 cm long, plus peduncle 10–15 cm long; lateral 6–7 cm long in total, clearly shorter than the internode. *Spikelets* with hairy rachilla; spikelet bracts leafy, up to 3–4 cm long, hairy; glumes 4–5 mm long, straw-coloured; external glumes hairy. *Nutlet* globose, 3 mm diam; hypogynium triangular, margin yellowish brown thickened, black inside, white to beige.

Specimen. MADAGASCAR, Antsiranana, Ambilobe, Ifasy Valley, 50–200 m, 31 Mar. 1951, *H. Humbert & R. Capuron* 25909 (K).

Note — This specimen has a peculiar hypogynium (Fig. 5b–c). *Scleria gaertneri* has a perfectly regular trilobed hypo-

gynium, whereas this specimen has a triangular thickened yellowish one. The inflorescence is triangular, and it is made up of spikelets with long conspicuous bracts resembling those of *S. boivinii*. These bracts are not found in *Scleria gaertneri*.

3. *Scleria* aff. sect. *Abortivae*

Herb, underground parts not collected. *Culm* 2.5 m by 0.5–0.8 mm. *Leaves* 30–35 by 2.5–3.5 cm, praemorse, glabrous; central vein of the abaxial side pilose; contraligule triangular, edge ciliate and red; leaf sheath winged. *Inflorescence* 30 cm long, formed by lateral and terminal panicles 8–15 cm in length, laterals being longer than the internodes; inflorescence bracts leafy, longer than the inflorescence. *Spikelets* with rachilla greenish, puberulous; spikelet bracts greenish, up to 1 cm, ciliate along the margin; flowers mostly male; glumes 4–5 mm, both external and internal completely purple, puberulous. *Nutlet* tuberculate, scabrid, purple, 4–5 by 2.2–3 mm, ovoid, apiculate; hypogynium, trilobate, yellowish, ciliate on the apex of the lobes.

Specimen. MADAGASCAR, 1600 m, 9 Nov. 1999, *P.J. Rakotomalaza & D. Ravelomanantsoa* 2128 (K, MO).

Note — This taxon belongs to sect. *Abortivae* but has rugose nutlets with a marked mucro. The hypogynium is also quite different from those found in other species of this section. However, the inflorescence resembles the inflorescence of *S. trialata*. Along with *S. madagascariensis*, *S. trialata*, and this specimen are these only taxa having winged leaf sheaths in this section.

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