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Notes on the flora of Madagascar, 1-5

Martin W. Callmander, Peter B. Phillipson & Laurent Gautier (ed.)

Abstract

CALLMANDER, M. W., P. B. PHILLIPSON & L. GAUTIER (ed.) (2010). Notes on the flora of Madagascar, 1-5. *Candollea* 65: 359-376. In English, English and French abstracts.

Ongoing research on Madagascar's flora is revealing numerous taxonomic novelties and nomenclatural inconsistencies, and providing new data on species distribution. This is the first article in a series that aims to provide the botanical community working on the flora of Madagascar an opportunity to publish short communications on these topics. – *Note 1*. Dealing with *Indigofera nivea* (*Leguminosae*) – a new name for Madagascar and a new combination for Africa, by Martin W. Callmander, Jean-Noël Labat & Brian D. Schrire. The authors resolve the application of “*Indigofera nivea*”. *Indigofera nivea* Spreng. is a valid name for an African species now referred to the genus *Indigastrum* Jaub. & Spach, for which a new combination, *Indigastrum niveum* (Spreng.) Schrire & Callm., is published. The illegitimate later homonym by Viguier refers to a species endemic to Madagascar, for which a new name, *Indigofera viguieri* Callm. & Labat, is published. – *Note 2*. Distribution of *Cyperus chamaecephalus* Cherm., a forest undergrowth species with inconspicuous inflorescences, by Laurent Gautier, Louis Nusbaumer, Isabel Larridon & Martin W. Callmander. The distribution of *Cyperus chamaecephalus*

Résumé

CALLMANDER, M. W., P. B. PHILLIPSON & L. GAUTIER (ed.) (2010). Notes sur la flore de Madagascar, 1-5. *Candollea* 65: 359-376. En anglais, résumés anglais et français.

Les recherches en cours sur la flore de Madagascar révèlent de nombreuses nouveautés taxonomiques, des problèmes de nomenclature et de nouvelles données sur la distribution des espèces. Cette note est la première d'une série destinée à donner à la communauté botanique internationale travaillant sur Madagascar la possibilité de publier de courtes contributions traitant de ces aspects. – *Note 1*. A propos d'*Indigofera nivea* (*Leguminosae*) – un nom nouveau pour Madagascar et une nouvelle combinaison pour l'Afrique, par Martin W. Callmander, Jean-Noël Labat & Brian D. Schrire. Les auteurs résolvent l'application du nom «*Indigofera nivea*». *Indigofera nivea* Spreng. est un nom valide pour une espèce africaine qui se rattache maintenant au genre *Indigastrum* Jaub. & Spach et pour lequel la nouvelle combinaison: *Indigastrum niveum* (Spreng.) Schrire & Callm. est proposée. L'homonyme illégitime publié par Viguier, pour sa part, se réfère à une espèce endémique de Madagascar pour laquelle un nouveau nom d'espèce est proposé: *Indigofera viguieri* Callm. & Labat. – *Note 2*. Distribution de *Cyperus chamaecephalus* Cherm., une espèce de sous-bois possédant des inflorescences discrètes, par

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Cherm., a frequently overlooked forest undergrowth species with inconspicuous inflorescences, has been very poorly documented. The authors report several recent discoveries which permit a more complete understanding of its geographical distribution in Madagascar's lowland and mountain rainforests. – *Note 3.* The genus *Korthalsella* (*Santalaceae*) in Madagascar, by Martin W. Callmander, Peter B. Phillipson, Roy E. Gereau, Gérard Aymonin & Amir Sultan. The authors present a review of the genus *Korthalsella* Tiegh. (*Santalaceae*) for Madagascar. The identity of *Korthalsella taenioides* (Juss.) Engl., consistently confused by previous authors, is discussed in detail. Three other species known to occur in Madagascar are enumerated: *Korthalsella gaudichaudii* (Tiegh.) Lecomte, *Korthalsella madagascariensis* Danser and *Korthalsella japonica* (Thunb.) Engl. – *Note 4.* Forsyth-Major 348: four collections, two names, all referring to *Mimulopsis madagascariensis* (*Acanthaceae*), by Laurent Gautier & Martin W. Callmander. Among Forsyth-Major's botanical collections, an individual collection number often comprises a set of specimens representing different gatherings. The authors clarify one of these collection sets: *Forsyth-Major 348*, on which the names *Strobilanthes isoglossoides* Lindau and *Mimulopsis forsythii* S. Moore are based, unambiguously designating type material. Both taxa are placed in synonymy under *Mimulopsis madagascariensis* (Baker) Benoist. – *Note 5.* The genus *Brackenridgea* A. Gray (*Ochnaceae*) in Madagascar, by Martin W. Callmander, Sven Buerki & Peter B. Phillipson. The two Malagasy species described in *Pleuroridgea* Tiegh. (*Ochnaceae*) are lectotypified and formally transferred to *Brackenridgea* A. Gray. The needed combinations: *Brackenridgea madecassa* (H. Perrier) Callm. and *Brackenridgea tetramera* (H. Perrier) Callm. are provided. Conservation status assessments for the two species are also provided.

Key-words

ACANTHACEAE – CYPERACEAE – LEGUMINOSAE – OCHNACEAE – SANTALACEAE – *Indigofera* – *Indigostrum* – *Cyperus* – *Strobilanthes* – *Mimulopsis* – *Korthalsella* – *Brackenridgea* – *Pleuroridgea* – Madagascar – Africa – Nomenclature – Taxonomy – IUCN Red List – Forsyth-Major

Laurent Gautier, Louis Nusbaumer, Isabel Larridon & Martin W. Callmander. La distribution de *Cyperus chamaecephalus* Cherm. n'a été jusqu'à maintenant que peu documentée. Les auteurs rapportent plusieurs nouvelles découvertes qui permettent une meilleure connaissance de sa distribution qui s'étend aux forêts de basse altitude et de montagne à Madagascar. – *Note 3.* Le genre *Korthalsella* (*Santalaceae*) à Madagascar, par Martin W. Callmander, Peter B. Phillipson, Roy E. Gereau, Gérard Aymonin & Amir Sultan. Les auteurs présentent un compte-rendu du genre *Korthalsella* Tiegh. (*Santalaceae*) pour Madagascar. L'identité de *Korthalsella taenioides* (Juss.) Engl., en général mal interprétée, est discutée en détail. Trois autres espèces présentes à Madagascar sont énumérées: *Korthalsella gaudichaudii* (Tiegh.) Lecomte, *Korthalsella madagascariensis* Danser et *Korthalsella japonica* (Thunb.) Engl. – *Note 4.* Forsyth-Major 348: quatre collections, deux noms, le tout rapporté à *Mimulopsis madagascariensis* (*Acanthaceae*), par Laurent Gautier & Martin W. Callmander. Parmi les collections botaniques de Forsyth-Major, un numéro comprend souvent une série de plusieurs spécimens représentant clairement différentes récoltes. Les auteurs clarifient le statut des récoltes associées à l'un de ces numéros: *Forsyth-Major 348*, sur lesquelles sont basés deux noms validement publiés: *Strobilanthes isoglossoides* Lindau et *Mimulopsis forsythii* S. Moore. Le matériel typique de ces deux noms est clairement désigné et les deux noms sont mis en synonymie de *Mimulopsis madagascariensis* (Baker) Benoist. – *Note 5.* Le genre *Brackenridgea* A. Gray (*Ochnaceae*) à Madagascar, par Martin W. Callmander, Sven Buerki & Peter B. Phillipson. Les deux espèces malgaches décrites dans le genre *Pleuroridgea* Tiegh. (*Ochnaceae*) sont lectotypifiées et transférées dans le genre *Brackenridgea* A. Gray. Les combinaisons nécessaires sont publiées: *Brackenridgea madecassa* (H. Perrier) Callm. et *Brackenridgea tetramera* (H. Perrier) Callm. Le statut de conservation des deux espèces est également présenté.

Communication of the editors

Madagascar is well-known for its high biological diversity and endemism, and numerous efforts are in progress to document its unique flora. Our knowledge of the flora is advancing steadily, but remains far from complete. The “Flore de Madagascar et des Comores” series, published by the Paris Museum national d’Histoire naturelle has treated 165 (75%) of the 222 traditionally recognised vascular plant families in Madagascar since the first volume was published in 1936 while full or partial taxonomic treatments for genera in some of the outstanding families have been published elsewhere (notably in the journal “Adansonia”). Some excellent detailed monographs are also available (such as for the legumes and palms, both published by The Royal Botanic Gardens, Kew). However, some genera lack any complete taxonomic treatment, and furthermore many of the earlier treatments are now badly outdated and are of little use today. Overall many groups of plants are in urgent need of taxonomic revision.

The “Catalogue of Vascular Plants of Madagascar”, an online database being developed by Missouri Botanical Garden (<http://www.efloras.org/madagascar>), presents a synthesis of published data on the flora of Madagascar. It includes taxonomic data, images, vernacular names and information on the conservation status for all vascular plant species occurring naturally in Madagascar. It will eventually provide an analysis of the current status of the taxonomy for every genus and an estimated number of undescribed species. The nomenclatural data and synonymy of the “Madagascar Catalogue” have been integrated with the “African Plants Database” (APD) that has been developed by the Conservatoire et Jardin botaniques de la Ville de Genève and the South African National Biodiversity Institute in Pretoria (<http://www.ville-ge.ch/cjb/bd/africa/>). Work on the “Madagascar Catalogue” and its integration with the APD has revealed numerous taxonomic novelties and nomenclatural inconsistencies, which is serving to highlight the need for taxonomic revisions and other shorter scientific articles for in many groups of plants.

Another important factor responsible for advancing our knowledge of the Madagascar flora is the increasing number of specimens being collected by Malagasy researchers, generally in partnership with foreign botanical institutions. In addition to fuelling taxonomic treatments and systematic studies with important new material, this collecting effort broadens our view of species distribution patterns and often reveals spectacular extension of species distributions ranges.

The editors are pleased to present the first in a series of notes on the Malagasy flora that will allow researchers studying the flora of Madagascar to publish relevant information in the form of brief communications in the framework of a rapid editorial process. The “Notes on the flora of Madagascar” series may include contributions in either English or French.

Message des éditeurs

Madagascar est réputée pour sa haute diversité biologique et son endémisme, et de nombreux efforts sont en cours pour inventorier sa flore exceptionnelle. Notre connaissance de celle-ci progresse régulièrement, mais est encore loin d’être complète. Depuis la parution du premier volume en 1936, la «Flore de Madagascar et des Comores», publiée par le Muséum National d’Histoire naturelle de Paris, a jusqu’à présent traité 165 des 222 familles de plantes vasculaires traditionnellement reconnues à Madagascar, soit le 75%. Des traitements complets ou partiels de genres appartenant à des familles emblématiques de Madagascar sont parus ailleurs (et notamment dans le périodique «Adansonia»). D’excellentes monographies détaillées sont également disponibles, comme celle des légumineuses ou des palmiers, publiées par les Royal Botanic Gardens, Kew. Toutefois, des traitements taxonomiques complets manquent encore pour certains genres et, parmi ceux qui ont été traités il y a longtemps, certains sont malheureusement désuets. Globalement, de nombreux groupes ont sérieusement besoin d’être révisés.

Le «Catalogue of Vascular Plants of Madagascar» est une base de données en ligne développée par le Missouri Botanical Garden (<http://www.efloras.org/madagascar>). Elle présente une synthèse des données publiées sur la flore de Madagascar et comprend des données taxonomiques, des images, des noms vernaculaires et des informations sur le statut de conservation pour l’ensemble des plantes vasculaires indigènes ou naturalisées à Madagascar. A terme, elle fournira une analyse de l’état actuel de la taxonomie de chaque genre et une estimation du nombre d’espèces à décrire. Les données de nomenclature et la synonymie du «Madagascar Catalogue» ont été récemment intégrées à l’«African Plant Database» (APD) développée par les Conservatoire et Jardin botaniques de la Ville de Genève et le South African National Biodiversity Institute (<http://www.ville-ge.ch/cjb/bd/africa/>). Les travaux menés sur le «Madagascar Catalogue» et l’opération d’intégration de ces données dans l’APD ont mis en lumière de nombreuses nouveautés taxonomiques et incohérences nomenclaturales, mettant une fois de plus en lumière la nécessité de mener des révisions taxonomiques et de publier de courtes communications dans de nombreux groupes de plantes.

Les nombreux spécimens récoltés récemment par les chercheurs malgaches souvent en partenariat avec des institutions botaniques étrangères majeures contribuent également de manière prépondérante à l’amélioration de notre connaissance de la flore de l’Ile. Par leur apport important de matériel aux traitements taxonomiques et aux études systématiques, cet effort de récolte améliore grandement notre compréhension de la distribution des espèces et révèlent souvent de spectaculaires augmentations des aires de répartition.

They will typically address topics such as new combinations, lectotypifications, nomenclatural problems, rediscoveries, and important new information on distribution of taxa, that may be regarded a too short for a conventional journal article. The publication of newly discovered species will be generally beyond the scope of the series.

We would like to invite potential contributors to submit their contributions to one of the editors of the series. We sincerely hope that these “Notes on the flora of Madagascar” will prove helpful to both authors and readers, and benefit the whole scientific community working on Madagascar’s unique biota.

Les éditeurs sont heureux de présenter ici une première série de notes sur la flore de Madagascar qui permettent aux chercheurs qui étudient la flore de la Grande Ile de publier des résultats sous la forme de communications brèves dans le contexte d’un processus éditorial accéléré. La série «Notes on the flora of Madagascar» se propose de publier des contributions en français ou en anglais qui pourraient être considérées comme trop courtes pour faire l’objet d’articles scientifiques à proprement parler, traitant de nouvelles combinaisons, de lectotypifications, de la résolution de problèmes nomenclaturaux, de redécouvertes de taxons et d’importantes modifications d’aires de distribution. La publication de nouvelles espèces est considérée comme étant en dehors du cadre de ces contributions.

Nous voudrions inviter ici les auteurs potentiels à soumettre leurs contributions à l’un des éditeurs de la série. Nous espérons que ces «Notes on the Flora of Madagascar» s’avèreront utiles aussi bien aux auteurs qu’à leur lecteurs, et qu’elles serviront la cause de la communauté scientifique internationale qui travaille sur l’exceptionnelle richesse biologique de Madagascar.

1. CALLMANDER, Martin W., Jean-Noël LABAT & Brian D. SCHRIRE:

Dealing with *Indigofera nivea* (Leguminosae) – a new name for Madagascar and a new combination for Africa

Introduction

This first note deals with the name “*Indigofera nivea*” which comprises two homonyms (one based on material from Madagascar and the other on material from southern Africa). A new species name is required for the illegitimate later homonym published by VIGUIER (1949) for which no valid name is available. The name *I. viguieri* Callm. & Labat is published here note for this Malagasy species. *Indigofera nivea* Spreng. was validly published by SPRENGEL in 1826, but has been generally overlooked or confused in the literature. It is an earlier name for the southern African plant that has been known as *Indigastrum argyraeum* (Eckl. & Zeyh.) Schrire (SCHRIRE, 1992). A new combination in the genus *Indigastrum* Jaub. & Spach is required, which is published here as *I. niveum* (Spreng.) Schrire & Callm. Another tentative use of the specific epithet *nivea* was as a misapplied synonym of *Indigofera glomerata* E. Mey. (MEYER, 1832). He placed a question mark in his synonymy indicating his doubt about the identification of the Sprengel name.

Taxonomy and nomenclature of *Indigofera nivea* Spreng.

Indigofera viguieri Callm. & Labat, **nom. nov.**

≡ *Indigofera nivea* R. Vig. in Notul. Syst. (Paris) 13: 368. 1949 [non Spreng., Syst. Veg. 3: 273. 1826].

Typus: MADAGASCAR. **Prov. Mahajunga:** Ambongo, rive droite de la Mahavavy, Itampika, 13°38'23"S 48°40'06"E, V.1902, fl., *Perrier de la Bâthie 1434* (holo-: P [P0007766]!; iso-: K [K000392972]!, P [P0007767, P0007768]!).

Observations. – *Indigofera nivea* R. Vig., published in VIGUIER (1949), is endemic to Madagascar and was accepted as a valid name in “Leguminosae of Madagascar” by DU PUY & al. (2002). Viguier’s name is in fact a later homonym of *I. nivea* Spreng., and no valid name is available for the Malagasy species. The species is a small subshrub with densely white-woolly leaves and stems. *Indigofera viguieri* can be distinguished from the most closely related species, *I. kirkii* Oliv., by its densely white-woolly leaves (vs. the thinly white strigose leaves in *I. kirkii*), the more coriaceous texture of the leaves, and pods with 3-5 (vs. 1-3) seeds (DU PUY & al., 2002). It is known from only two collections made by Perrier de la Bâthie in northwestern Madagascar on sand dunes bordering the Betsiboka and Mahavavy rivers.

Etymology. – We name this species after René Viguier (1880-1931), from Caen (France), who made a major contribution to the knowledge of *Leguminosae* in Madagascar. René Viguier undertook a full revision of the family that he left unpublished when he died in 1931. Most of Viguier’s work was validated posthumously thanks to H. Humbert (VIGUIER, 1949, 1950, 1952) and his unpublished manuscript, “les Légumineuses de Madagascar” served as the basis for the “Leguminosae of Madagascar” (DU PUY & al., 2002).

Conservation status. – With an EOO of 18 km² and only two collections known, both dating back over one hundred years, and these comprising only two subpopulations, none of which occur in a protected network, *I. viguieri* is best assigned a preliminary status of “Critically Endangered” (CR A3c; B2ab[iii]) following the IUCN Red List Categories and Criteria (IUCN, 2001) (calculation following CALLMANDER & al., 2007).

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JNL: Muséum national d'Histoire Naturelle, Département Systématique et Evolution, UMR 7205, case postale 39, rue Cuvier 57, 75231 Paris, cedex 05, France.

BDS: Herbarium, Library, Art & Archives, Royal Botanic Gardens Kew, Richmond, Surrey, TW9 3AB, United Kingdom.

***Indigastrum niveum* (Spreng.) Schrire & Callm., comb. nova**

≡ *Indigofera nivea* Spreng., Syst. Veg. 3: 273. 1826.

Typus: SOUTH AFRICA. W. Cape Prov.: Willdenow 13890 (holo-: B-W!).

= *Indigofera argyraea* Eckl. & Zeyh., Enum. Pl.: 239. 1836. ≡ *Indigastrum argyraeum* (Eckl. & Zeyh.) Schrire in *Bothalia* 22: 168. 1992. **Typus:** SOUTH AFRICA. E. Cape Prov.: Tembuland, nr. Klipplaat R. & Swart Kei R., by Shiloh Mission, 1060-1200 m, I-III. 1832, *Ecklon & Zeyher 1595* (lecto-: S!; isolecto-: B! G! M! SAM! TCD!) (lectotypified by SCHRIRE, 1992).

Observations. – Taxonomic research by SCHRIRE (1991, 1992, 1995) and molecular phylogenies (SCHRIRE & al., 2003, 2009), provided the background that justified the resurrection of the genera *Microcharis* Benth. and *Indigastrum*, which had generally been placed in synonymy under *Indigofera* L. (SCHRIRE, 1992). Among others, the taxon *Indigofera argyraea* was therefore transferred to the genus *Indigastrum*. In “Plants of southern Africa: names and distribution” (ARNOLD & DE WET, 1993), Schrire placed *Indigofera nivea* in synonymy under *Indigastrum argyraea*, based on unpublished information before he was able to study the type. More recently after studying the type in the Willdenow collection in Berlin, the identity of the Sprengel name was confirmed, and it became apparent that *Indigofera argyraea* and *I. nivea* are indeed conspecific, the necessary new combination being made here.

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2. GAUTIER, Laurent, Louis NUSBAUMER, Isabel LARRIDON & Martin W. CALLMANDER:

Distribution of *Cyperus chamaecephalus* Cherm., a forest undergrowth species with inconspicuous inflorescences

Introduction

While conducting floristic and vegetation surveys in Manongarivo Special Reserve (NW Madagascar) in 1999 (GAUTIER, 2002; MESSMER & al., 2002), a specimen of a rather frequent *Cyperaceae* species was collected in the undergrowth of a plot at 1200 m elevation in montane forest. It was only in the late afternoon while pressing the specimen for later routine identification of sterile vouchers that it became apparent that the specimen was fertile, bearing inconspicuous inflorescences concealed among the sheets of the basal rosette of leaves. More adequate material of the species was collected the next morning on the same location. It was later identified using “Flore de Madagascar et des Comores” (CHERMEZON, 1936) as *Cyperus chamaecephalus* Cherm., and confirmation was made possible by means of a scanned image of the holotype kindly provided by Stockholm Herbarium (S), collected by Karl Afzelius in 1912 in Moramanga, the only material cited in the Flore. The species has since been further collected in the framework of flora and vegetation surveys conducted by CJB and Département de Biologie et Ecologie végétales of Antananarivo University in Loky-Manambato (Daraina) region as well as in Montagne d’Ambre (TRIGUI, 2010).

Cyperus chamaecephalus Cherm. in Bull. Soc. Bot. France 72: 20. 1925.

Typus: MADAGASCAR. Prov. Toamasina: Moramanga, vid bäck i urskogen [near streams in pristine forest]; [18°57’S 48°13’E], [1000 m], 18.XII.1912, *Afzelius s.n.* (holo-: S [S-G-6606]; isotype: S) (scanned images seen).
= *Cyperus* sp. 1 in GAUTIER (2002: 117).

Observations. – The distribution of *C. chamaecephalus* has been very poorly documented. In “Flore de Madagascar et des Comores” (CHERMEZON, 1936), the species being only known from the type. Due to its inconspicuous fertile parts, the species

has certainly often been overlooked by plant collectors. Nevertheless, a few specimens have slowly accumulated in herbaria. The recent collections from northern Madagascar clearly show that this species is rather widely distributed in the undergrowth of lowland and montane rainforests, from ca. 300 m to 1200 m elevation (Fig. 1). It displays a classical Eastern/Central Domain distribution of HUMBERT (1955). It is noteworthy that the species has been able to reach Montagne d’Ambre in the North (TRIGUI, 2010), an isolated volcanic massif of recent origin covered with rainforest but separated by a dry vegetation gap of at least 100 km, with the two humid massifs of the Daraina region possibly acting as stepping-stones for dispersal (NUSBAUMER & al., 2010). *Cyperus chamaecephalus* has not been recorded in the Sambirano Domain. The species could be absent there due to the more seasonal rainfall regime in that area.

Cyperus chamaecephalus is part of a group of rainforest-dwelling species which are unusual in the genus (SIMPSON, 1992). Furthermore, this species displays an atypical inflorescence position for the family: the stem is only a few centimeters long (Fig. 2). As a consequence all leaves are positioned in a basal rosette and inflorescences are at ground level, among the litter of the forest undergrowth. Implications for pollination and dispersal have been questioned by SIMPSON (1992) for another species of the group sharing similar features, drawing attention to the low probability of wind pollination and the possibility of autogamy or insect pollination. Regarding seed dispersal, the mechanisms proposed by SIMPSON (1992) (wind, water drops, or passing animals) would only allow dispersal over short distances. Presence in Daraina and Montagne d’Ambre could only be explained by a much more humid climatic past with continuous rainforest, or alternatively by long distance dispersal through avian endozoochory. However, these features are very unusual in *Cyperaceae* and would be worth studying in detail.

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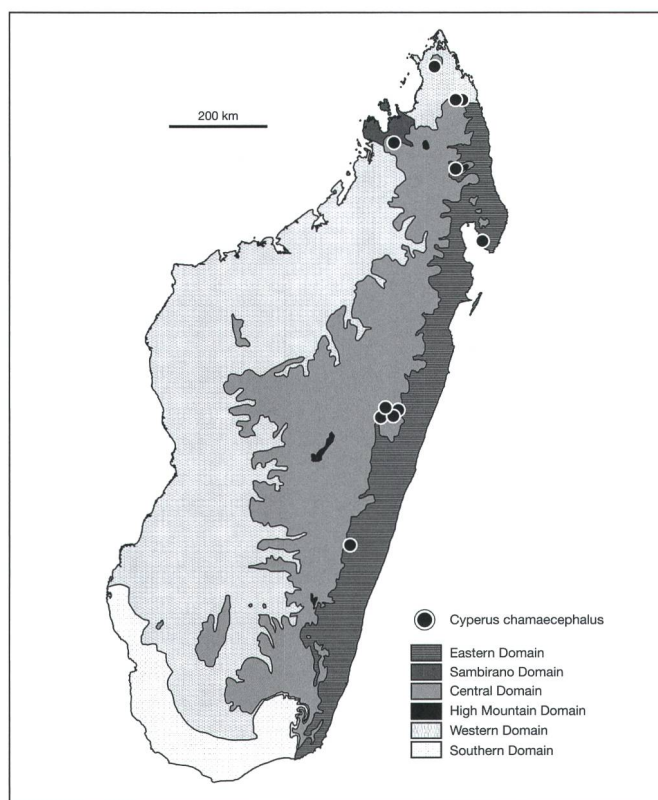


Fig. 1. – Distribution of *Cyperus chamaecephalus* Cherm. on the phytogeographical map of HUMBERT (1955).

Conservation status. – With an EOO of 103.666 km², an AOO of 90 km² and 8 subpopulations, 6 of which in the protected area network (Montagne d’Ambre, Loky-Manambato [Daraina], Manongarivo, Marojejy, Masoala, Andasibe-Périnet), *Cyperus chamaecephalus* is assigned a preliminary status of “Least Concern” (LC) following the IUCN Red List Categories and Criteria (IUCN, 2001) (calculation following CALLMANDER & al., 2007).

Other specimens. – **MADAGASCAR. Prov. Antsiranana:** Manongarivo, Ambahatra, cours supérieur, crête entre les deux bras de l’Ambahatra, forêt dense de montagne, versant, 13°59’S 48°26’E, 1200 m, 13.III.1999, *Gautier & al.* 3556 (G, TAN, P, MO, K, WAG); Montagne d’Ambre, partie centrale, 12°36’ 45’’S 49°09’54’’E, 1160 m, 6.XI.2007, *Gautier & al.* 5141 (G, TEF, P, MO, K, WAG); Daraina, forêt de Binara, 13°13’40’’S 49°35’30’’E, 862 m, 13.XII.2005, *Nusbaumer & Ranirison* 1780 (G, TEF, P, MO); Daraina, forêt d’Antsahabe, forêt dense humide sempervirente, haut de versant, 29.XI.2004, *Nusbaumer & Ranirison* 1294 (G, TEF, P, MO, K); Daraina, forêt d’Antsahabe, 13°13’36’’S 49°33’09’’E, 1040 m, 29.XI.2004, *Nusbaumer & Ranirison* 2289 (G); Contreforts occidentaux du Massif de Marojejy (N-E), près du col de Doanyanala (limite des bassins de la Lokoho et de l’Androranga), [14°28’S 49°32’E], [ca. 1100 m], 25.I-25.II.1949, *Humbert* 23032 (P). **Prov. Fianarantsoa:** Ifanadiana, [21°18’S 47°38’E], [c. 430 m], XII.1962,

Bosser 18814 (P). **Prov. Toamasina:** Moramanga, Ambohibary, Ampitambe, Sahaivo forest, 18°50’ 28’’S 48°17’32’’E, 1074 m, 9.XI.2006, *Antilahimena & Edmond* 4919 (MO, P, TAN, TEF); Moramanga, Parc National de Mantady, 18°50’S 48°30’E, 995 m, 29.XII.1992, *Beentje* 4774 (K); Périnet, rocher ombragé et humide, forêt ombrophile, [18°56’S 48°26’E], [c. 1000 m], XII.1962, *Bosser* 16912 (P); Analanjrofo, Masoala Peninsula, ca. 3 km NE of Antalavia, along Antalavia River, 15°47’S 50°02’E, 260-380 m, 13-16.XI.1989, *Schatz & al.* 2789 (GENT, MO, P).

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Fig. 2. – Field photograph of *Cyperus chamaecephalus* Cherm., in Antsahabe forest (Daraina) corresponding to collection Nusbaumer & Ranirison 1294. [Photo: Louis Nusbaumer]

3. CALLMANDER Martin W., Peter B. PHILLIPSON, Roy E. GEREAU, Gérard AYMONIN & Amir SULTAN: The genus *Korthalsella* (Santalaceae) in Madagascar

Introduction

Philibert Commerson was the first person known to have used the name "*Viscum taenioides*", handwritten on labels for his collections from Reunion Island and Madagascar. For nearly two centuries, the nomenclatural validation of this species name in the literature has been attributed to CANDOLLE (1830), both in the genus *Viscum* L. and after its transfer by ENGLER (1897) to the genus *Korthalsella* Tiegh. (now treated as *Santalaceae*). Recently, MOLVRAY (1997), in her synopsis of the genus based on morphometric (MOLVRAY, 1990) and molecular phylogenetic studies (MOLVRAY & al., 1999), treated it as a broadly circumscribed species distributed from Africa, the Indian Ocean basin, and Oceania to the Pacific Islands.

Our review of the genus *Korthalsella* for Madagascar has revealed that Commerson's name was first validly published by JUSSIEU (1789) and not by CANDOLLE (1830), and should be cited as *Viscum taenioides* Juss. Furthermore, we judge Jussieu's original material to represent a different species from the specimens that were later seen by CANDOLLE (1830), which have been associated wrongly with *V. taenioides* ever since. The name *Korthalsella taenioides* (Juss.) Engl. has thus been consistently misapplied. We aim to clarify this confusion in the present note, and to account for the other species of the genus that are known from Madagascar: *K. gaudichaudii* (Tiegh.) Lecomte, *K. japonica* (Thunb.) Engl. and *K. mada-gascarica* Danser.

The identity of *Korthalsella taenioides*

The name *Viscum taenioides* (or the orthographic variant "*Viscaria taenioides*") appears on original handwritten collector's labels that accompany a Commerson gathering from "Bourbon" (now Reunion Island). The known specimens comprise: one sheet at P-JUSS (n° 10117); two sheets in the general collection at P [P00578618, P00578617] and a single sheet at G [G0096606]. These herbarium sheets bear other labels in Antoine-Laurent de Jussieu's handwriting, stating that he hesitates whether the species is new or should be identified as *Viscum opuntioides* L. (see also DANSER, 1937: 139). A second Commerson gathering from Madagascar is known, comprising a specimen at P-JUSS (n° 10118), a duplicate in the general herbarium at P [P00648559] and another at G [G0009 6606]. These specimens also bear labels with the name "*Viscum taenioides*" in Commerson's handwriting. The specimen at P-JUSS also bears a label on which it is written in the hand of Adrien-Henri de Jussieu's (Antoine-Laurent Jussieu's son): "... J'ai adopté néanmoins le nom [*Viscum*] *taenioides* pour ce gui..." [... I have nevertheless adopted the name *taenioides* for this mistletoe...].

The earliest publication of the name *V. taenioides* was by the elder JUSSIEU (1789: 213) who, referring to the genus *Viscum*, wrote in his *Genera Plantarum*: "*Frutices aut suffrutices parasitici; quidam aphylli ramis compressis quasi articulatis, ut in V. opuntioide L. & in V. taenioides Commers. cujus articuli breviores creberrimi*"; i.e. "parasitic shrubs or

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subshrubs; some leafless with branches flattened and almost articulated, as in *V. opuntoides* and *V. taenioides* Comm. whose articles [i.e. of the latter species] are shorter and very crowded". This final phrase clearly refers to the peculiar and distinctive short, broad internodes (articles) and congested overlapping branches of the specimen from Madagascar that contrast with the much longer and narrower internodes and more open branching of the gathering from Reunion, and this phrase thus constitutes a validating diagnosis for *Viscum taenioides* Juss. It is clear that Jussieu regarded the specimen from Madagascar and the plant from Reunion to represent different species, a view with which we entirely concur.

Viscum taenioides was later mentioned by DU PETIT-THOUARS (1811: 43), who provided no descriptive information, but clearly referred to Jussieu, and stated the plant to be common in W. Indian Ocean islands as a whole. However in his treatment of *Viscum*, CANDOLLE (1830: 283) appears to have overlooked the fact that the name *V. taenioides* had been published by Jussieu, referring only to DU PETIT-THOUARS (1811). Under the name *V. taenioides*, Candolle referred to a species from Mauritius and Reunion based on material he had in his herbarium (G-DC), attributing it to "Comm. ex Thouars". By referring to Du Petit-Thouars, CANDOLLE (1830) was making an indirect reference to an already existing name, i.e. *V. taenioides*, but misapplied the name to a different species. Because CANDOLLE (1830) did not fulfill the requirements for valid publication of a new name, his circumscription of *V. taenioides* does not constitute the publication of a later homonym and has no nomenclatural status.

ENGLER (1897: 138) transferred *V. taenioides* to the genus *Korthalsella*. He referred to the origin of the plant as "Bourbon", perpetuating the incorrect application of the name. The lectotypification of *K. taenioides* by MOLVRAY (1997: 269) cannot be accepted either because the specimen selected (G [G0096606]) is not part of the original material studied by Jussieu. Actually, no lectotypification is required, since the P-JUSS specimen should be regarded as the holotype.

TIEGHEM (1896) independently described *Bifaria commersonii* Tiegh. (= *Korthalsella commersonii* (Tiegh.) Danser) based on the Commerson collection in the general herbarium in P [P00648559] that is an isotype of *Viscum taenioides*, without reference to Jussieu's publication. *Bifaria commersonii* Tiegh. is therefore a heterotypic synonym of *K. taenioides*.

Korthalsella taenioides (Juss.) Engl. in Engler & Prantl, Nat. Pflanzenfam. Nachtr. II-IV: 138. 1897.

= *Viscum taenioides* Juss., Gen. Pl.: 213. 1789.

Typus: MADAGASCAR. Commerson s.n. (holo-: P-JUSS [cat. n° 10118]!; iso-: G [G00096602]!; P [P00648559]!).

= *Bifaria commersonii* Tiegh. in Bull. Soc. Bot. France 43: 176. 1896. = *Loranthus commersonii* (Tiegh.) Lecomte, Cat. Pl. Madagascar: 7. 1932. = *Korthalsella commersonii* (Tiegh.) Danser in Bull. Jard. Bot. Buitenzorg 14: 154. 1937. **Typus:** MADAGASCAR: 1770 or 1771, Commerson s.n. (holo-: P [P00648559]!; iso-: G [G00096602]!; P-JUSS [cat. n°10118]!).

Commerson's Madagascar collections generally lack any collection localities or dates, but are believed to have been made in 1770 and 1771 along the east coast, mainly in the south-east near the town Taolagnaro (DORR, 1997); we therefore cannot determine the exact collection locality of the type of *K. taenioides*. In 1924, some 150 years after Commerson first collected it, a second gathering of the species was made (*Perrier de la Bâthie 16157*) in the Tsaratanana Mountain in northern Madagascar. In the last four years, the species was rediscovered on the eastern slopes of Madagascar at Ambatovy, near Moramanga (Fig. 1) (*Antilahimena & al. 6790 & 7526, Razanatsoa & Marcellin 274*). After a careful examination of the specimens available, and keeping in mind the exceptionally rich and highly endemic biota of Madagascar (GOODMAN & BENSTEAD, 2005), we consider *K. taenioides* to be endemic to Madagascar, where it is known only from two rather distant localities. A more complete molecular study is currently being undertaken by one of us (AS), to better understand this extraordinary species and its systematic position within the genus.

The other species of *Korthalsella* in Madagascar

Much of the material wrongly referred to *K. taenioides* (or *Viscum taenioides*) by CANDOLLE (1830) and latter authors is probably best referred to *Korthalsella japonica* s.l. (= *K. opuntia* (Thunb.) Merr. sensu DANSER, 1937). This includes some specimens from the Western Indian Ocean Islands (Fig. 2), notably type material of the following: *Bifaria bojeri* Tiegh. (= *Korthalsella opuntia* var. *bojeri* (Tiegh.) Danser), holotype from the Mascarenes; *Bifaria humblotii* Tiegh. (= *Korthalsella humblotii* (Tiegh.) Engl.), holotype from the Comoros; *Bifaria richardii* Tiegh. (= *Korthalsella richardii* (Tiegh.) Engl.), syntypes from Madagascar and the Mascarenes. The taxonomy of *K. japonica*, a widely-distributed species that also occurs in Africa, the Himalayas, southern China, Tropical Asia, and Australia, is complex and is currently under investigation by one of us (AS).



Fig. 1. – Living plant of *Korthalsella japonica* (Thunb.) Engl. at Kalabenono corresponding to collection Callmander & al. 640. [Photo: M. W. Callmander]

Among other material from Madagascar and the Mascarenes that has been variously treated as a separate species or as a variety of *K. japonica* (or the misunderstood *K. taenioides*) is a plant that stands out morphologically, having distinctive long, flattened internodes with typically five longitudinal ribs that are broadest towards the apex and attenuate at the base. The correct name for this plant is *K. gaudichaudii*; it was effectively lectotypified by MOLVRAY (1997) on a specimen from Reunion at P (*Gaudichaud s.n.*; lecto-: P [P00568720]!).

The fourth species that occurs in Madagascar is *K. madagascariensis*. MOLVRAY (1997) placed it in synonymy under *K. salicornioides* (A. Cunn.) Tiegh., which is endemic to New Zealand. Both species have cylindrical internodes and decussate phyllotaxy, but *K. madagascariensis* is distinct from *K. salicornioides* in being somewhat larger and having longer internodes (see DANSER, 1937). *Korthalsella salicornioides* is parasitic on *Leptospermum scoparium* Forst. & Forst. f. s.l. and *Kunzea ericoides* (A. Rich.) Joy. Thomps. s.l. (both

Myrtaceae), while *Korthalsella madagascariensis* has been recorded on *Diospyros* L. (*Ebenaceae*) and *Leptolaena* Thouars (*Sarcolaenaceae*, a family endemic to Madagascar) (BALLE, 1960). Palynological data suggest a smaller pollen size for *Korthalsella madagascariensis* (P axis 25 μm , E plane 16 μm) (MULLER & al., 1989) compared with *K. salicornioides* (P axis 26-33 μm , E plane 20-25 μm) (MOAR, 1993).

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Fig. 2. – Living plant of *Korthalsella taenoides* (Juss.) Engl. at Ambatovy corresponding to collection Antilahimena & al. 7526. [Photo: P. Antilahimena]

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4. GAUTIER, Laurent & Martin W. CALLMANDER:

Forsyth-Major 348: four collections, two names, all referring to *Mimulopsis madagascariensis* (Acanthaceae)

Introduction

Dr Charles Immanuel Forsyth-Major (1843-1923) was a British medical doctor and scientist. In 1886, he abandoned his medical practice to devote himself entirely to scientific research (DORR, 1997). He travelled to Madagascar between 1894 and 1896 to primarily gather a paleontological collection of mammals for the British Museum of Natural History in London (JENKINS & CARLETON, 2005, including a comprehensive survey of his collection localities). He also collected c. 900 botanical specimens between Oct. 1894 and Apr. 1895 on the highlands of Madagascar around Antsirabe and Ambositra in the eastern-central region of Madagascar (DORR, 1997). These plant collections were deposited primarily at the British Museum Herbarium (BM) at the Royal Botanic Gardens, Kew (K), and at Berlin (B). From correspondence archived at the Conservatoire et Jardin botaniques de la Ville de Genève, it appears that a set of duplicates was also sent to W. Barbey at the Boissier herbarium by Dr Woodward from BM in 1895, while Forsyth-Major was still in Madagascar. Following his return to Europe numerous collections were again sent to the Boissier herbarium. It was arranged that the Boissier herbarium would further distribute Forsyth-Major's duplicates. The collections were arranged in duplicate sets and it seems that the first set was dispatched to the Candolle herbarium (also in Geneva), and possibly also a second set to the Smithsonian Institution (US). Both the Boissier and the Candolle herbaria are now incorporated in the collections of the Conservatoire et Jardin botaniques in Geneva (G). Undistributed duplicate sets have recently been discovered at G with a label reading "Plantes de Madagascar récoltées en 1895 par le docteur C.-J. Forsyth-Major [...] Distribuées en 1900 par l'herbier Boissier".

Among Forsyth-Major's botanical collections, an individual collection number often comprises a set of specimens of the same species (at least from his point of view), sometimes bearing different collection dates and which clearly represent different gatherings.

The aim of this note is to clarify one of these collection sets: *Forsyth-Major 348*, which includes material collected on Dec. 19th, 21th & 26th, 1894 and January 1st, 1895 all in "Ambohitombo forest (Tanala)". This locality is located East of Betsileo region; ca. 20°40'S 47°24'E (JENKINS & CARLETON, 2005). LINDAU (1897: 315) described *Strobilanthes isoglossoides* Lindau based on the Dec. 19th gathering, which was later transferred to the genus *Mimulopsis* Schweinf. More than a decade later, *M. forsythii* S. Moore was described, based on the Dec. 26th gathering (MOORE, 1906: 217). Although being based on the same collection number these two names cannot be considered as homotypic synonyms because the collection dates of the holotypes confirm that they represent two different gatherings. However, we consider both specimens to be conspecific and correctly determined as *M. madagascariensis* (Baker) Benoist, a species that was initially described as *Echinacanthus madagascariensis* Baker in 1883, eleven years before the Forsyth-Major gatherings were made. Generic delimitation in *Acanthaceae* is notoriously difficult, as witnessed by the various generic transfers to which the two names have been subjected, so we provide brief notes below on the differences between the genera in question.

Nomenclature

Mimulopsis madagascariensis (Baker) Benoist, Cat. Pl. Madag., Acanth.: 16. 1939.

≡ *Echinacanthus madagascariensis* Baker in J. Linn. Soc., Bot. 20: 218. 1883.

Typus: MADAGASCAR. Central, 10.1882, *Baron 1531* (holo-: K [K000394138]!; iso-: P [P00435427]!)

= *Strobilanthes isoglossoides* Lindau in Bot. Jahrb. Syst. 24: 315. 1897. ≡ *Mimulopsis isoglossoides* (Lindau) Bremek. in Bot. Jahrb. Syst. 73: 144. 1943.

Typus: MADAGASCAR: Ambohitombo forest (Tanala), 1350-1440 m, 19.XII.1894, *Forsyth-Major 348 (19.12.1894)* (holo-: B [B100359724]!; iso-: K!, G [G00096806, G00096807]!, P!, MO!, US!).

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= *Mimulopsis forsythii* S. Moore in J. Bot. 44: 217. 1906. **Typus:** MADAGASCAR. Ambohitombo forest (Tanala), 1350-1440 m, 26.12.1894, *Forsyth-Major 348 (26.12.1894)* (holo-: BM [BM000931014]!; iso-: K!, G [G00096808, G00096809]!, P!, MO!).

Observations. – *Mimulopsis madagascariensis* is characterized by its yellow, campanulate corolla, and the anther locule which bears a basal spur. The type material of *M. forsythii* and *Strobilanthes isoglossoides* presents exactly this floral morphology, and in all other ways conforms to *Mimulopsis madagascariensis*. These names should be therefore considered as synonyms of *M. madagascariensis*.

Mimulopsis Schweinf. is a genus of 16 currently known species from tropical Africa (nine species) and Madagascar (seven species). A recent evaluation of the genus in Madagascar reveals that probably seven additional species are still to be described (Ravolomanana & al., *pers. comm.*). Two Malagasy *Mimulopsis* species, *M. lyalliana* (Nees) Baron and *M. madagascariensis* (Baker) Benoist, were originally described in *Echinacanthus* Nees.

Echinacanthus is now regarded as restricted to four Asian species (Bhutan, Nepal and India) and differs from *Mimulopsis* by having both pairs of anther cells spurred instead of one (WOOD, 1994). The two Malagasy species originally described in this genus have only one pair of anther cells spurred and were later transferred to *Mimulopsis*.

The delimitation of *Strobilanthes* Blume is rather problematic, and, as discussed above, one of the Malagasy species originally referred to *Strobilanthes* is correctly placed in *Mimulopsis*. *Strobilanthes* is the second largest genus of *Acanthaceae* with ca. 250 species (CARINE & SCOTLAND, 2002) distributed in tropical and subtropical regions of Asia. It has been defined traditionally as having a tubular corolla with five subequal lobes, two or more ovules in each cell and 2 to 4 seeds in their capsules, and anthers that are always muticous, but this definition is not satisfactory since it includes certain clearly discordant elements. A new concept of the genus was adopted by WOOD & al. (2003) who recognized a number of monophyletic groups within *Strobilanthes* s.l. that are well supported by molecular data (MOYLAN & al., 2004) and have some morphological and geographic coherence (CARINE & SCOTLAND, 2002). The ten species of *Strobilanthes* accepted by BENOIST (1967) in the “Flora of Madagascar” should be excluded and will be formally transferred to *Acanthopale* C. B. Clarke in a forthcoming publication (Phillipson & Callmander, *pers. comm.*).

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5. CALLMANDER, Martin W., Sven BUERKI & Peter B. PHILLIPSON: The genus *Brackenridgea* A. Gray (Ochnaceae) in Madagascar

Introduction

The genus *Pleuroridgea* Tiegh. is the result of revision of generic concepts in the *Ochnaceae*, in which he split the family into 53 genera, of which 46 were described as new (VAN TIEGHEM, 1902). Among these, *Pleuroridgea* was defined by the orientation of the cotyledons that are laterally-disposed and by the non-laciniate stipules (VAN TIEGHEM, 1902). Delimited in this way, the genus originally comprised 5 species from Central and East Africa, while *Brackenridgea* A. Gray was restricted to nine species from south-east Asia and the south Pacific islands.

Despite the fact that PERRIER DE LA BÂTHIE (1941) stated *Pleuroridgea* to be morphologically very similar to the genus *Brackenridgea* A. Gray, he maintained the genus adding two new Malagasy species: *Pleuroridgea madecassa* H. Perrier and *P. tetramera* H. Perrier.

However, the differences between the African and the Asian species have not been considered sufficient to merit separation at the generic level, and the genus *Pleuroridgea* has not generally been accepted (for example, GILG, 1925). The five species placed there by van Tieghem are now consistently referred to *Brackenridgea* by authors working on African floras (four are treated as synonyms of a broadly circumscribed *B. zanguebarica* Oliv.). ROBSON (1962) summarized the distinguishing characters of the three genera of *Ochnaceae* present in the “Flora Zambesiaca” region (*Brackenridgea*, *Ochna* L. and *Ouratea* Aubl.) noting that *Brackenridgea* was distinguished by: “a lobed ovary with gynobasic style and a fruit with several separate 1-seeded drupelets borne on the more or less enlarged receptacle”. Robson’s point of view has been followed in other floras for Africa (DUTOIT & OBERMEYER, 1976; VERDCOURT, 2005). Furthermore DUTOIT &

OBERMEYER (1976) specifically included the Malagasy species in their count of four species present in “tropical and subtropical Africa and Madagascar”, without mentioning any details or providing the needed new combinations. We confirm that the Malagasy species are comfortably encompassed by the current circumscription of *Brackenridgea*, concurring with SCHATZ (2001) who included *Brackenridgea* in his generic key to *Ochnaceae* in Madagascar.

This note serves to (1) formally transfer the two Malagasy endemic *Pleuroridgea* species to *Brackenridgea*; (2) lectotypify the two species that were validly described by PERRIER DE LA BÂTHIE (1941) with multiple syntypes. It has been prepared within the context of Missouri Botanical Garden’s “Catalogue of Vascular Plants of Madagascar project”, which aims to disseminate up-to-date information on-line (www.efloras.org/madagascar) and in printed media.

Taxonomy and nomenclature of the Malagasy species of *Brackenridgea*

The genus *Brackenridgea* comprises ca. 12 species distributed from Africa to the Fiji Island (SCHATZ, 2001). Two species are endemic to Africa: *B. arenaria* (De Wild. & T. Durand) N. Robson (Central Africa) and *B. zanzibarica* (East Africa). A third species from Tanzania (Mafia Island) probably merits description (VERDCOURT, 2005). The remaining species occur in South-East Asia (Andaman Island, Malaysia, Philippines to New Guinea) to Southern Pacific (Fiji) and Australia (Queensland) (KANIS, 1968). We have reviewed the available material referred to *Pleuroridgea* by PERRIER DE LA BÂTHIE (1941) and specimens which have been collected subsequently to evaluate species level taxonomy. This review confirms the presence in Madagascar of two endemic species:

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***Brackenridgea madecassa* (H. Perrier) Callm., comb. nova**

≡ *Pleuroridgea madecassa* H. Perrier in Notul. Syst. (Paris) 10: 37. 1941.

Lectotypus (designated here): **MADAGASCAR. Prov. Antsiranana:** Mt Ambohipiraka, [13°10'30"S 46°06'00"E], 10.1932, fl. *Perrier de la Bâthie 18759* (lecto-: P [P00048463]!; iso-: P [P00048464, P00048465]!).

Conservation status. – With an EOO of 162 244 km², an AOO of 36 km² and 11 subpopulations, even though none are situated within the protected area network, *B. madecassa* is assigned a preliminary status of “Least Concern” (LC) following the IUCN Red List Categories and Criteria (IUCN, 2010) (calculation following CALLMANDER & al., 2007).

Observations. – *Brackenridgea madecassa* can be recognised by its pentamerous flowers; short (2 mm) style; 5-10 carpels and 13-20 stamens (PERRIER DE LA BÂTHIE, 1941). *Brackenridgea madecassa* is widespread in Madagascar growing in dry to humid forests.

***Brackenridgea tetramera* (H. Perrier) Callm., comb. nova**

≡ *Pleuroridgea tetramera* H. Perrier in Notul. Syst. (Paris) 10: 38. 1941.

Lectotypus (designated here): **MADAGASCAR. Prov. Toliara:** Vallée moyenne du Mandrare, près d’Anadabolava, Mt Vohitrosy, 700-800 m., [24°12'40"S 49°19'00"E], 12.1933, fl., *Humbert 12687* (lecto-: P [P000484668]!; isolecto-: G [G00006139]!, P [P000484666, P000484667]!).

Conservation status. – With only two collections known, both collected by Henri Humbert near Anadabolava in the Mandrare valley dating back to December 1933, an EOO of 9 km², one subpopulation not in the protected area network, *B. tetramera* is assigned a preliminary status of “Critically Endangered” (CR A3c; B2ab[iii]) following the IUCN Red List Categories and Criteria (IUCN, 2001) (calculation following CALLMANDER & al., 2007).

Observations. – *Brackenridgea tetramera* can be recognised by its tetramerous flowers; long (8 mm) style; 3-4 carpels and 8-10 stamens (PERRIER DE LA BÂTHIE, 1941). The species grows in southwestern Madagascar in the sub-arid bush.

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