CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Twenty-fourth meeting of the Plants Committee
Geneva (Switzerland), 20, 21 and 23-26 July 2018

Species specific matters

Maintenance of the Appendices

REPORT OF THE SPECIALIST ON BOTANICAL NOMENCATURE

1. This document has been submitted by the nomenclature specialist of the Plants Committee.*

2. **Standard References adopted at CoP17 - Cactus Checklist**: The most substantive update at CoP17 was the adoption of the CITES Cactaceae Checklist (3rd Edition), given the number of new taxa and the impact of molecular studies on this group since the last addition of the Checklist in 1999, any move forward would be a significant challenge. With a completely revised checklist on the table, CoP17 adopted decisions to monitor its use and impact. Decisions 17.314-317 relate to the use of the checklist and asks Parties to report to the Secretariat on any issues that may arise on its use; the Secretariat to liaise with UNEP-WCMC on the utility of the Checklist and report to the PC on the feedback it receives from Parties and UNEP-WCMC. The responses to these requests were not available at the time of preparation of this document but they are likely to include comment relating to:

   - Lack of access by UNEP-WCMC to an electronic version of the checklist to facilitate the update of their databases
   - Corrections post CoP17
   - Corrections of errors and omissions
   - Use of the concept of “Alternative Names” and how best to deal with these in terms of CITES permitting
   - That some taxa that were included in earlier editions of the checklist, but which are not included in the third edition.

   A number of complex issues arising from the Periodic Review still remain unresolved and their resolution might best be accomplished in association with a limited revision of the checklist. There is also the practical issue in day to day permitting of dealing with names which are recommended for rejection, which have no formal accepted name, for example *Eriosyce kunzei*, and which can be found in trade. A simple practical resolution is required – which could best be dealt with in an update by inserting recommendations for a standardised approach.

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* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

In addition, the editor of the checklist has outlined a limited number of updates and corrections that he would like to make. Dr Hunt's comments are included in Annex I to this document as a PDF.

Action: The Nomenclature Working Group is asked to consider whether the cactus checklist should be the subject of a limited revision for CoP18, and if so, propose the most effective mechanism to update the checklist which ensures that the Parties will have the most practical, effective and up-to-date tool at their disposal for the implementation of this family listing. Noting that as PC24 is the last meeting prior to CoP the mechanism will need to be robust to deliver an update acceptable to the Parties.

3. **Standard References adopted at CoP17 – *Dalbergia* and *Diospyros* – populations of Madagascar:** Decision 17.206 paragraph b) tasks the Plants Committee to continue supporting the preparation a standard reference for Madagascan populations of these genera. These checklists were adopted to support Parties in their implementation of these listings. They were clearly seen to be "works in progress" with this in mind Dr Porter P. Lowry II of Missouri Botanic Gardens facilitated access to the following reviews. Due to the importance of the issue the full text of the reviews is included.

TAXONOMY OF DALBERGIA (FABACEAE) IN MADAGASCAR: SUMMARY OF CURRENT STATUS

Peter B. Phillipson, Missouri Botanical Garden, St. Louis, MO 63110, USA Simon Crameri, ETH Zurich, Zurich, Switzerland 15 May 2018

A total of 48 species of *Dalbergia* are currently recognized in Madagascar (Madagascar Catalogue, 2018). The most recent taxonomic revision is contained in the monograph of Du Puy et al. (2002), based largely on Bosser & Rabevohitra (1996), who described 30 taxonomic novelties, including 20 new species. Five additional species were subsequently published by Bosser & Rabevohitra (2005). All species are endemic to Madagascar except one, which also occurs on mainland Africa. Practicing botanists who have used these references to identify plant material have frequently experienced difficulty due to several factors. 1) The availability of flowers, fruits and vegetative parts is often required, yet specimens frequently lack either flowers or fruits, and indeed the fruits of certain species were unknown to Bosser and Rabevohitra. 2) Many of the distinctions between species are based on incremental characters that show considerable variation and overlap. 3) The current taxonomic treatment recognizes many infraspecific taxa (2 species are divided into subspecies and 6 species are divided into varieties), an interpretation that may be justified, but that complicates the identification process. During routine identification of *Dalbergia*, it has become clear to users of the current treatment that the taxonomy of the genus is far from adequate. Attempts to identify voucher specimens collected for studies focusing on DNA sequences and wood anatomy (many of which lack flowers and fruits) have been particularly challenging, and many initial identifications were inconsistent with results conclusions from molecular analyses. The currently available taxonomy and identification tools are clearly inadequate and need to be refined and updated.

A recent 3-week review of specimens in the Paris herbarium showed that while some species appear to be well defined, others that are widespread (as currently delimited) vary morphologically across their geographic range and may in reality comprise two or more distinct taxonomic entities. In other cases, much of the material currently identified as belonging to a given species differs quite obviously from the type (reference) specimen and thus appears to have been assigned to that species by Bosser & Rabevohitra and others because there was nowhere better to put it. In all, about half of the 48 currently recognized species of *Dalbergia* appear to be well defined, but the remainder will require careful study to reevaluate and clarify their limits and to assess their conservation status. More practical, user-friendly identification tools are also needed that can be employed when flowers or fruits are lacking (as is often the case). For this, additional fieldwork and further detailed herbarium studies are required over a period of 18-24 months, which would be strengthened by linking taxonomic reassessments and conclusions to information from studies using data from DNA as well as wood anatomy and spectral characteristics. As this work proceeds, the Madagascar Catalogue (2018), which currently provides a partial synthesis of the conclusions reached to date, will be updated regularly.

References

Bosser, J. & R. Rabevohitra. 1996. Taxa et noms nouveaux dans le genre *Dalbergia* (Papilionaceae) à Madagascar et aux Comores. *Bull. Mus. Natl. Hist. Nat., B, Adansonia, sér. 4*, 18: 171-212.

Bosser, J. & R. Rabevohitra. 2005. Espèces nouvelles dans le genre *Dalbergia* (Fabaceae, Papilionoideae) à Madagascar. *Adansonia, sér. 3*, 27(2): 209–216.

Du Puy, D. J., J. N. Labat, R. Rabevohitra, J. F. Villiers, J. Bosser & J. Moat. 2002. *The Leguminosae of Madagascar*. Royal Botanic Gardens, Kew, London, 737 pp.

Madagascar Catalogue. 2018. Catalogue of the plants of Madagascar. Missouri Botanical Garden, St. Louis & Antananarivo [http://www.tropicos.org/project/mada].

TAXONOMY OF DIOSPYROS (EBENACEAE) IN MADAGASCAR: SUMMARY OF CURRENT STATUS

George E. Schatz & Porter P. Lowry II, Missouri Botanical Garden, St. Louis, MO 63110, USA 15 May 2018

The most recent taxonomic revision of *Diospyros* was published two-thirds of a century ago by Perrier de la Bâthie (1952a, b), who recognized 112 taxa (97 species and 15 infra-species), some of which were placed at the time in the genera *Maba* and *Tetraclis*, which have since been included within *Diospyros*. Over the last several decades, however, botanists have encountered many difficulties using this treatment, primarily because the identification keys often require both flowers and fruits, and also because many species were poorly defined, due in large part to a lack of adequate material (in many cases just one or a few collections were cited). Today, more than 4,000 collections are now available, a 12-fold increase from the 1950s, providing a vastly improved basis for assessing species limits as well as their geographic distribution and conservation status. A comprehensive review of the genus in Madagascar was begun in 2009, which has led to the recognition of 85 described species (Schatz & Lowry, 2011, 2013; Madagascar Catalogue, 2018) and the placement in synonymy of the remaining names accepted by Perrier de la Bâthie. All but four of these 85 species are endemic to Madagascar. The taxonomic review of *Diospyros* has also revealed an additional ca. 155 well delimited species that have not yet been named and described, and are therefore new to science, many of which have been regularly confused with published species. A total of 21 of these new species are currently being described (Schatz & Lowry, in review; Mas et al., in review) and manuscripts are now being completed that include an additional 18 new species. Work on several other papers has been initiated, but 3 to 5 years will be required to complete the process of describing the remaining ca. 100 species and to assess their conservation status.

References

Madagascar Catalogue. 2018. Catalogue of the plants of Madagascar. Missouri Botanical Garden, St. Louis & Antananarivo [http://www.tropicos.org/project/mada].

Mas, C., P. P. Lowry II and G. E. Schatz. Révision taxonomique des *Diospyros* L. (Ebenaceae) de la région Malgache. II. Le groupe Gracilipes. *Boissiera* (in review).

Perrier de la Bâthie, H. 1952a. Révision des Ebénacées de Madagascar et des Comores. *Mém. Inst. Sci. Madag.*, *sér. B, Biol. Vég*. 4: 93–154.

Perrier de la Bâthie, H. 1952b. Ebénacées. *Flore de Madagascar et des Comores* 165: 1–129.

Schatz, G. E. and P. P. Lowry II. 2011. Nomenclatural notes on Malagasy *Diospyros* L. (Ebenaceae). *Adansonia, sér. 3*, 33: 271–281.

Schatz, G. E., P. P. Lowry II, C. Mas and M. W. Callmander. 2013. Further nomenclatural notes on Malagasy *Diospyros* L. (Ebenaceae): Goudot types in the Geneva herbarium. *Candollea* 68: 307–309

Schatz, G. E. and P. P. Lowry II. Taxonomic Studies of *Diospyros* L. (Ebenaceae) from the Malagasy Region. III. New Species from the Island of Nosy Mangabe in the Bay of Antongil. *Novon* (in review).

Action: The Nomenclature Working Group is asked to consider these reviews and based on the timelines of this research make recommendations on when an update of the lists for CITES would be most practical. Noting that as the current research timelines are not compatible with the deadlines for the next CoP an alternative option would be to issue a notification informing Parties that updates will be regularly available on the Madagascar Catalogue and although not formally adopted these updates could assist CITES Parties in decision making.

4. **Standard References requiring updates – Orchids:** With the support of funding from Switzerland, UNEP-WCMC and the Royal Botanic Gardens, Kew are preparing a draft update of key genera from Volume 1 of the checklist (published in 1995!) – this includes the widely traded Slipper Orchids. Unfortunately, a draft is not available for this meeting. However, the process should enable a resource estimate to be made for a comprehensive update of core orchid genera in trade/full update of all genera. Revision of Volume 1 is a priority from the non-timber checklists.

5. **Standard References requiring updates – *Aloe* and *Pachypodium*:** During correspondence on the updating of Species+, South Africa supplied additional information on changes in Aloe. Some of these can be included in Species + as synonymy. The original *Aloe* and *Pachypodium* Checklist was published in 2001, with a minor addendum in 2007. With the recent publication of *Succulent Plants – A guide to CITES -listed species* – in a highly attractive and user-friendly version online and hardcopy – it would seem apposite to commence an update of "succulent plant" checklists in a similar format, starting with the *Aloe* and *Pachypodium* list. It is recommended that this is a priority from the non-timber checklists. Some proposals to amend the Appendices may also be required.

   Action: The Nomenclature Working Group review the recommendation that the *Aloe* and *Pachypodium* Checklist be updated for CoP19, and also recommend funding sources.

6. **Standard References requiring updates - Generic References:** There has been a limited response from Parties with regards to whether new generic references are required. As the most practical way forward it is recommended that the current generic references (Mabberley 1998, and Willis 1973) be removed from the standard list of references at CoP18 and thereafter updates be made on a case by case basis. Post CoP18 the Plants Committee may wish to review this issue again and also consider a review of the names currently used at the higher level in the Appendices.

   Action: The Nomenclature Working Group consider the proposal to delete the current standard general references for generic names and thereafter work on a case by case basis.

7. **New references for adoption at CoP18 *Caesalpinia echinata* (Pau- Brazil):** Following discussions at PC23 it is recommended that *Paubrasilia echinata* (Lam.) E. Gagnon, H.C. Lima & G.P. Lewis published as Gagnon et al., 2016 PhytoKeys 71: 1-160 http://phytokeys.pensoft.net/articles.php?id=9203 be adopted as the standard name for this taxon. The list of standard references will be amended to reflect the adoption of the new name for this taxon. An outstanding issue is the status and distribution of *Platymiscum pleiostachyum*. A review of the genus Platymiscium (19 species) was carried out in 2005 by Bente B. Klitgraard (Platymiscium (Leguminosae: Dalbergieae); biogeography, systematics, morphology, taxonomy and uses. Kew Bulletin. Vol. 60, No. 3 (2005), pp. 321 – 400). This review included *Platymiscium pleiostachium* Donn. Sm. in *Platymiscium parviflorum* Benth. which the author describes as having a distribution of "infrequent and scattered over a wide geographical area in Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica". To resolve issues surrounding this taxon, an option is to recommend that Klitgraard (2005) be adopted as the standard reference for the taxon, if this does not expand the original intent of the 1975 listing.

   Action: That the Nomenclature Working Group confirm the adoption of a standard reference for *Paubrasilia echinata* and give a view whether the inclusion *Platymiscium pleiostachium* Donn. Sm. in *Platymiscium parviflorum* Benth. would expand the intent of the 1975 listing.

8. **Updates of Species +**: Updates based on PC recommendations include: *Pachypodium enigmaticum,* included as an accepted species, on an interim basis until CoP18 *Paubrasila echinata* included as a synonym of *Caesalpinia echinata*; *Nardostachys jatamsai* (D.Don) DC. and *Nardostachys chinensis* Batalin included as a synonym of *Nardostachys grandiflora* DC. Annex II of this report contains a table relating to names of Aloe species, initially produced by UNEP-WCMC, which has been added to and reviewed by experts on the taxa. Following previous discussion at the Plants Committee the changes recommended in rows 1-15 and 17 to 18 have been included in Species+. The changes in rows 16 and 19 – 23 require PC approval before change in Species +. The USA has noted that a previously identified error has not yet been corrected. The name *Gyrinops audate* (Glig) Domke (with synonym *Aquilaria audate* (Oken) Merr) was included in the original listing proposal for this genus. The correct name is *Gyrinops caudata* (Gilg) Domke with a synonym *Aquilaria caudata*. This should be corrected in Species + and all relevant database and, as appropriate, a Notification issued to the Parties.

   Action: The Nomenclature Working Group, should review the proposed changes to Species+ for *Aloe* and *Gyrinops*/*Aquilaria*.

9. **Weblinks:** Currently the standard references which have weblinks are those new lists which are not available as published checklists. The older weblinks were removed due to frequent breaks in the links. All these have been inputted to Species+. It would be ideal to have all references as weblinks on the same site where they can be subject to frequent checks by the host – especially following revamps of host sites. Currently this ideal situation is not easily achievable, but guidance is available from the Nomenclature Specialist on access to the core references.

   Action: The Nomenclature Working Group is asked to review whether the current weblisting of CITES checklists is sufficient to meet the needs of the Parties.

10. **Updating Nomenclature between CoPs:** PC23 recommended that PC24 further consider this issue with a view to establish a clear mechanism.

    Action: That the Nomenclature Working Group consider the issue of updating nomenclature between CoP' s and whether written guidance should be prepared on what is possible and to ensure the standardised application of the process over time.

11. **Funding of Nomenclature Position and Role of Nomenclature Specialist:** This issue being considered by a joint working group on the Terms of Reference of the Animals and Plants Committee and will be discussed in the joint meeting of these committees.

12. **"Timber Checklists":** This issue overlaps with that covered by Decision 17.167 and is discussed in the report of the Timber Identification Working Group. The issue of checklists for Madagascan populations of *Dalbergia* and *Diospyros* has been addressed in paragraph 3 of this report. Since CoP17 the full genus *Dalbergia* has been listed on Appendix II. As priority for "timber" checklists a full genus checklist for *Dalbergia* is considered as first priority (noting that high quality work on the Madagascan taxa is underway) and as second priority a revised list for *Diospyros* populations of Madagascar. To facilitate discussion on a full checklist for *Dalbergia* UNEP-WCMC was requested by the Nomenclature Specialist to prepare an information document for this meeting on the names of *Dalbergia* currently held in Species + and a full list of source references. To further facilitate discussions and assist the work of the Timber Identification Working Group, the Nomenclature Specialist requested experts at the UK CITES Scientific Authority for Plants to briefly review the current work on *Dalbergia* and the time and resources required to prepare a full checklist – this review is included in Annex III. This review should be read in conjunction with the information on Malagasy taxa included in paragraph 3 and the document prepared by the Timber Identification Working Group. The RBG Kew review proposal estimates a three - year project at a cost of £432,000 to produce a full checklist.

    Action: That the Nomenclature Working Group review all relevant documents tabled at this meeting and make recommendations for options to produce a science based and practical *Dalbergia* checklist for the CITES Parties and consider funding options and timelines for same.

13. **That the Plants Committee convene a Nomenclature Working Group to:**

    a) Consider whether the cactus checklist should be the subject of a limited revision for CoP18, and if so, propose the most effective mechanism to update the checklist which ensures that the Parties will have the most practical, effective and up-to-date tool at their disposal for the implementation of this family listing. Noting that as PC24 is the last meeting prior to CoP the mechanism will need to be robust to deliver an update acceptable to the Parties;

    b) Consider the review of Madagascan *Dalbergia* and *Diospyros* and based on the timelines of this research make recommendations on when an update of the lists for CITES would be most practical. Noting that as the current research timelines are not compatible with the deadlines for the next CoP an alternative option would be to issue a notification informing Parties that updates will be regularly available on the Madagascar Catalogue and although not formally adopted these updates could assist CITES Parties in decision making;

    c) Review the recommendation that the *Aloe* and *Pachypodium* Checklist be updated for CoP19, and recommend funding sources;

    d) Consider the proposal to delete the current standard general references for generic names and thereafter work on a case by case basis;

e) Confirm the adoption of a standard reference for *Paubrasilia echinata* and give a view whether the inclusion *Platymiscium pleiostachium* Donn. Sm. in *Platymiscium parviflorum* Benth. would expand the intent of the 1975 listing.

f) Review the proposed changes to Species+ for *Aloe* and *Gyrinops*/*Aquilaria*;

g) Review whether the current weblisting of CITES checklists is sufficient to meet the needs of the Parties;

h) Consider the issue of updating nomenclature between CoP's and how written guidance could best be prepared on what is possible and to ensure the standard application of the process over time;

i) Review all relevant documents tabled at this meeting and make recommendations for options to produce a science based and practical *Dalbergia* checklist for the CITES Parties and consider funding options and timelines for same; and,

j) Consider any other relevant issues raised at PC24 and make recommendations to the Committee.

CITES CACTACEAE CHECKLIST

Proposed update to the 3rd edition 2016

Rationale

Trade in plants of all species of Cactaceae and their parts and derivatives is controlled by the provisions of the CITES convention. However, three genera, *Pereskia*, *Pereskiopsis* and *Quiabentia,* are currently exempted, as are artificial propagations of a selected list of hybrids and cultivars. All the others are subject to the provisions of either CITES Appendix II or the more stringent Appendix I, which covers various individual species and some genera *in toto.*

This proposed update is concerned exclusively with the taxa subject to the provisions of CITES Appendix II. No potential changes to the App. I listings and exemptions are suggested, these being within the remit of national scientific authorities and not that of the compiler.

The changes proposed include 1. Corrections, including the insertion of the genera accidentally omitted; 2. Summary list of substantive changes to the generic classification of the Cactaceae proposed since April 2017; 3. Revision of the 'Annotated list of Changes' on pp. 16-19 of the current Checklist and addition some names of genera and synonyms not currently accepted but still used in trade lists and horticultural inventories to provide a more comprehensive listing as in the previous edition of the Checklist (1999); 4. Updating the list of References (page 20) of the current Checklist.

The nomenclature of plants is governed by rules laid down by the International Association of Plant Taxonomists (IAPT) but taxonomy itself is not an exact science and is not yet subject to any form of national or international regulation or scientific governance. It has been said that the notion that species (and genera) are *fixed entities* underpins every international agreement on biodiversity conservation and this may indeed account for the long intervals between the publication of previous issues of this CITES Checklist. Yet more than 1000 new names applying to species and subspecies of cacti were published in the period between the first and second editions of this list (approx. seven years) and a further 1000+ between the second and third editions. Furthermore, the great majority of these 'scientific' names have been proposed by horticulturists (nurserymen, 'cactus explorers' and private collectors) with little or no scientific background or inclination to preserve adequate material for scientific evaluation. The advent of molecular and 'phylogenetic' systematics, coupled the proliferation of on-line hobby magazines and recent relaxation of the rules of nomenclature threatens the ever-precarious stability of cactus classification unless an attempt is made to keep the CITES Cactaceae Checklist, as a 'standard reference' updated on a regular, if not annual basis, without compromising its legislative nature or influencing the procedures involved in securing the listing (or de-listing) of individual taxa on CITES App. I.

Summary list of proposed substantive changes to the generic classification of the Cactaceae since April 2017

Aporocactus ('Alternative name') **:** Reinstated at generic rank (2 spp.) (see below)

Cephalocereus: Amplified to include the genus *Neobuxbaumia* (9 spp.). Ref.: Tapia, H.J., Bárcenas-Argüello, M.L., Terrazas T. & Arias, S. (27 Dec 2017), Phylogeny and Circumscription of *Cephalocereus* (Cactaceae) Based on Molecular and Morphological Evidence. Systematic Botany 42(4):1–15.).

Disocactus: Circumscription amended to exclude *Aporocactus* (2 spp.) and include three species of *Epiphyllum.* Ref.: Cruz, M.A., Arias, S. & Terrazas, T. (2016). Molecular phylogeny and taxonomy of the genus *Disocactus* (Cactaceae), based on the DNA sequences of six chloroplast markers. Willdenowia 46: 145–164. doi: http//dx.doi.org.10.3372,wi.46.46112

Epiphyllum*:* Three species transferred to *Disocactus* (see above)

Hylocereus: (14 spp.) Merged with *Selenicereus (see below)*

Morangaya ('Alternative Name'**):** Reinstated at generic rank (1 sp.)

Neobuxbaumia (9 spp.). Merged with *Cephalocereus* (see above)

[Pseudoacanthocereus: Status currently under discussion (2 sp.)]

Selenicereus: Amplified to include the genus *Hylocereus* (14 spp.) and two *Weberocereus* spp. Ref.: Hunt, D.R. (May 2017). Cactaceae Syst. Init. 36: 29–39; l.c. (Sept 2017) 37: 36. Korotkova, N., Borsch, T. & Arias, S. (Nov 2017): A phylogenetic framework for the Hylocereeae (Cactaceae) and implications for the circumscription of genera. Phytotaxa 327(1): 1–46.

Strophocactus: Circumscription currently under discussion (3 spp.)

Weberocereus: Two spp. transferred to *Selenicereus* (see above)

Note: The proposed changes potentially affect the currently accepted names of a total of about 35 CITES App. II species, but only 15 have been re-named as the others had previously been classified in the genera to which they are now re-assigned.

Proposed amendments to CITES Cactaceae Checklist ed. 3 (2016) Document 2

Note: All amendments concern App II taxa; No changes are proposed to App 1

Taxon concerned * Alternative name in CCC3 (2016)	Checklist update & type of change	Impact	Ref.
* Aporocactus flagelliformis	No change but genus now fully reinstated.	None	[1]
* Aporocactus martianus	No change but genus now fully reinstated	None	
Disocactus flagelliformis	= Aporocactus flagelliformis	None	
Disocactus martianus	= Aporocactus martianus	None	
Echinocereus pensilis	= Morangaya pensilis; genus (1 sp.) now reinstated	None	[2]
Epiphyllum anguliger	= Disocactus anguliger	None	[1]
Epiphyllum crenatum	= Discoactus crenatus	None	
Epiphyllum lepidocarpum	= Disocactus lepidocarpus	None	
Hylocereus	Genus (14 spp.) now included in Selenicereus	None	[3/4]
Hylocereus calcaratus	= Selenicereus calcaratus	None	
Hylocereus costaricensis	= Selenicereus costaricensis	None	
Hylocereus escuintlensis	= Selenicereus escuintlensis	None	
Hylocereus extensus	= Selenicereus extensus	None	
Hylocereus guatemalensis	= Selenicereus guatemalensis	None	
Hylocereus megalanthus	= Selenicereus megalanthus	None	
Hylocereus minutiflorus	= Selenicereus minutiflorus	None	
Hylocereus monacanthus	= Selenicereus monacanthus	None	
Hylocereus ocamponis	= Selenicereus ocamponis	None	
Hylocereus setaceus	= Selenicereus setaceus	None	
Hylocereus stenopterus	= Selenicereus stenopterus	None	
Hylocereus triangularis	= Selenicereus triangularis	None	
Hylocereus tricae	= Selenicereus tricae	None	
Hylocereus trigonus	= Selenicereus triangularis	None	
Hylocereus undatus	= Selenicereus undatus	None	
*Morangaya pensilis	No change but genus now fully reinstated	None	[2]
Neobuxbaumia	Genus (9 spp.) now inluded in Cephalocereus	None	[5]
Neobuxbaumia euphorbioides	= Cephalocereus euphorbioides	None	
Neobuxbaumia laui	= Cephalocereus laui	None	
Neobuxbaumia macrocephala	= Cephalocereus macrocephala	None	
Neobuxbaumia mezcalaensis	= Cephalocereus mezcalaensis	None	
Neobuxbaumia multiareolata	= *Cephalocereus multiareolata* (prov. accepted)	None	
Neobuxbaumia polylopha	= Cephalocereus polylopha	None	
Neobuxbaumia sanchezmejoradae	= Cephalocereus sanchezmejoradae	None	
Neobuxbaumia scoparia	= Cephalocereus scoparia	None	
Neobuxbaumia squamulosa	= Cephalocereus squamulosa	None	
Neobuxbaumia tetetzo	= Cephalocereus tetetzo	None	
Weberocereus	Two species transferred to Selenicereus	None	[4]
Weberocereus glaber	= Selenicereus glaber	None	
Weberocereus tonduzii	= Selenicereus tonduzii		

Principal references

[1] Cruz, M.A., Arias, S. & Terrazas, T. (2016). Molecular phylogeny and taxonomy of the genus *Disocactus* (Cactaceae), based on the DNA sequences of six chloroplast markers.Willdenowia 46: 145–164.

[2] Sánchez, D., Arias, S. & Terrazas, T. (2014). Phylogenetic relationships in *Echinocereus* (Cactaceae, Cactoideae) Systematic Botany 39(4): 1183-1196.

[3] Hunt, D.R. (May 2017). Cactaceae Syst. Init. 36: 29–39; l.c. (Sept 2017) 37: 36.

[4] Korotkova, N., Borsch, T. & Arias, S. (Nov 2017): A phylogenetic framework for the Hylocereeae (Cactaceae) and implications for the circumscription of genera. Phytotaxa 327(1): 1–46

[5] Tapia, H.J., Bárcenas-Argüello, M.L., Terrazas T. & Arias, S. (27 Dec 2017), Phylogeny and Circumscription of *Cephalocereus* (Cactaceae) Based on Molecular and Morphological Evidence. Systematic Botany 42(4):1–15.).

Annex II: ALOE NAME UPDATES FROM SOUTH AFRICA 10/MAY 2018
Table updated by Dr Ronell R Klopper
South African National Plant Checklist Co-ordinator
(corrections and additions in the table in green)

	Taxon	Additional details from reference	Actions
	Aloiampelos		
1	Aloiampelos ciliaris		Add as synonym of Aloe ciliaris
2	Aloiampelos ciliaris var. redacta		Add as synonym of Aloe ciliaris var. redacta
3	Aloiampelos ciliaris var. tidmarshii		Add as synonym of Aloe ciliaris var. tidmarshii
4	Aloiampelos commixta		Add as synonym of Aloe commixta
5	Aloiampelos decumbens		Add as synonym of Aloe gracilis var. decumbens
6	Aloiampelos gracilis		Add as synonym of Aloe gracilis
7	Aloiampelos juddii		Add as synonym of Aloe juddii
8	Aloiampelos striatula		Add as synonym of Aloe striatula
9	Aloiampelos striatula var. caesia		Add as synonym of Aloe striatula var. caesia
10	Aloiampelos tenuior		Add as synonym of Aloe tenuior
	Aloidendron		
11	Aloidendron barberae		Add as synonym of Aloe barberae
12	Aloidendron dichotomum		Add as synonym of Aloe dichotoma
13	Aloidendron eminens		Add as synonym of Aloe eminens
14	Aloidendron pillansii		Add as synonym of Aloe pillansii
15	Aloidendron ramosissimum		Add as synonym of Aloe ramosissima
16	Aloidendron sabaea		Add as synonym of Aloe sabaea
17	Aloidendron tongaense		Add as synonym of Aloe tongaensis
	Kumara		
18	Kumara plicatilis	Was originally named K. disticha, which was lumped into Aloe plicatilis. Now being split out again, but the name K. plicatilis takes precedence over K. disticha	Add as synonym of Aloe plicatilis
19	Kumara haemanthifolia		Add as synonym of Aloe haemanthifolia
	Gonialoe		
20	Gonialoe dinteri		Add as synonym of Aloe dinteri
21	Gonialoe sladeniana		Add as synonym of Aloe sladeniana
22	Gonialoe variegata		Add as synonym of Aloe variegata
	Aristaloe		

23	Aristaloe aristata		Add as synonym of Aloe aristata
	Chortolirion		
24	Chortolirion angolense	Become synonym of Aloe welwitschii since the name Aloe angolensis Baker (1878: 263) already exists	Add C. angolense and Aloe welwitschii as synonyms of Aloe
25	Chortolirion subspicatum		Add C. subspicatum and Aloe subspicata as synonyms of Aloe
26	Chortolirion tenuifolium	Become synonym of Aloe barendii since the name Aloe tenuifolia Lamarck (1783: 87) already exists. An older epithet at species level exists and the correct name should be Aloe bergeriana.	Add C. tenuifolium and Aloe barendii and Aloe bergeriana as synonyms of Aloe
27	Chortolirion latifolium	Become synonym of Aloe jeppeae since the name Aloe latifolia (Haworth 1804: 7) Haworth (1812: 82) already exists	Add C. latifolium and Aloe jeppeae as synonyms of Aloe

A World Checklist of Dalbergia L.f.

Bente Klitgård, Senior Research Leader, Identification & Naming department, RBGKew: The proposal below is developed in response to the questions given to me by Noel McGough and Valentina Vaglica, and here set out in ***blue bold italics***.

What is the current status of research on the genus Dalbergia and who are leading/working on rosewood at international level and where?

Phylogeny

- Dr Mohammad Vatanparast (University of Copenhagen) and collaborators published the first phylogeny of *Dalbergia* in 2013. Currently, Dr Vatanparast is collaborating on a more densely sampled phylogeny with Kew Dalbergieae specialist, Dr Bente B. Klitgård. They aim to resolve problem species complexes still using tried and tested Sanger sequencing methods. A densely sampled phylogeny based on NGS methods would, however, no doubt resolve taxonomic species boundaries between closely related species and provide a species-level taxonomic framework of the whole genus *Dalbergia* currently lacking.

Taxonomy

- Asia – Dr Shi-Jin Li, South China Botanical Garden, CAS is a specialist in the taxonomy of Asian *Dalbergia*. Dr Li will spend eight weeks in Kew in July and August, collaborating on *Dalbergia* systematics with Dr Klitgård.
- Africa – Currently only taxonomically and nomenclaturally outdated floristic treatments exist. No current active taxonomic research projects exist in Africa.
- Americas – In the recent publication "Ulloa Ulloa et al. 2017. An integrated assessment of the vascular plant species of the Americas. Science 358, 1614–1617", Dr David Neill undertook a preliminary evaluation of the *Dalbergia* species native in the Americas synthesising the information available in the checklists of the Vascular floras of Colombia, Ecuador, Peru, Argentina, Brazil, Venezuela, and Bolivia – in which the species names and species circumscriptions are not necessarily aligned. No taxonomic research was, however, undertaken in the process.
- Central America – Flora Mesoamericana (verified list of species in the Central American countries on Tropicos.www), but unpublished.
- Mexico – The UNEP-WCMC technical report "Overview of *Dalbergia* spp. from South and Central America". Species were selected according to www.tropicos.com and Vaglica (2014), but these names should be used with caution given that there are no taxonomic accounts available to validate the names.

Conservation incl. IUCN extinction risk Redlist assessments

- There are many different initiatives at regional level focussing on finding DNA barcodes and / or wood anatomical characteristics in attempts to identify provenances of rose-woods in trade. Too many to be listed here.

How long would it take to produce a good checklist?

It would be possible to produce a reliable checklist for the World's *Dalbergia* species inside a period of three years (36 months). The checklist would be available in hard copy and online for use on the www and as a mobile phone application. See GANTT chart below. In addition to an interactive fully-illustrated key to species for all *Dalbergia* species, the checklist will contain:

a) full synonymy of accepted names,
b) three-line diagnostic descriptions,
c) native and introduced geographical ranges,
d) known uses,
e) updated IUCN extinction risk Redlist assessments, and
f) a list of herbarium vouchers authoritatively annotated by taxonomic specialists.

How long would it take to produce a checklist focusing on Dalbergia species in trade?

Given that the taxonomic boundaries amongst *Dalbergia* species are still very blurred, as witnessed by questions such as "What names apply to which *Dalbergia* species?" and "What is the range of one species and where does the next start?", it would be impossible to produce a reliable and predictable checklist of *Dalbergia* species in trade in isolation from a full global checklist covering all *Dalbergia* species.

Activities	Kew Science Dept.	Year 1	Year 2	Year 3
Taxonomic research: Database and assemble literature, names, types and existing specimen information; production of a preliminary skeletal checklist from existing literature	Identification & Naming (I&N)			
Taxonomic research: digitising, imaging and georeferencing specimen data	I&N			
Taxonomic research: gap-filling field work, herbarium visits	I&N			
Taxonomic research: assemble representative samples of specimens; generate species hypotheses from critical assessment of herbarium specimens	I&N			
Taxonomic research: Molecular and character analysis. Test species hypotheses using data from e.g. DNA, morphology, wood anatomy.	I&N / CPFB / NC			
Taxonomic research: Synthesise species hypotheses with existing data to finalise nomenclature and typification, finalize key, descriptions and to be independently evaluated by experts pending publication	I&N			
Mapping and species modelling for IUCN extinction risk assessments	I&N / BISA			
IUpdate IUCN Extinction risk assessments for all *Dalbergia* species	I&N / Conservation			
Development of web resource and mobile phone application	I&N / BISA			
Conference presentation	I&N			
Stakeholder workshops at Kew – one in yr 1 and one in yr 3	I&N			

Gantt chart of project activities yr 1-3

What type or resources would be needed to perform this task?

Post / Role	Dept.	Band	%	Year 1	Year 2	Year 3
Senior taxonomist – project manager	I&N	F	20%			
Junior taxonomist	I&N	C	100%			
Specimen digitisation support	I&N	B	100%			
Molecular and other character analysis support	CPFB	C/E	60%			
GIS support – species distribution and threat mapping support	BISA	C	20%			
Updating IUCN species extinction risk assessments	Conservation	C	100%			
Bioinformatics support for web design and mobile app development	BISA	C	30%			

And all within Kew?

The project will be led and managed by Kew, and it is feasible to undertake as a fully in-house Kew project. However, given that pockets of taxonomic specialism already exist, e.g. in Asia, the Kew project leader will aim to collaborate as widely as possible to incorporate and benefit from the existing expertise. The collaboration will be facilitated on the one hand by stakeholder workshops in Kew, and on the other by Kew *Dalbergia* taxonomists paying visits to international herbaria and the institutions of international colleagues.

How much would it/they cost?

Type of cost	Yr 1	Yr2	Yr3	Total
Staff costs	**£ 102K**	**£ 72K**	**£ 103K**	**£ 277K**
Total staff costs				**£ 277K**
Non-staff costs				
Study visits to herbaria, fieldwork, conference participation, stakeholder workshops				£ 115K
Lab costs				£ 20K
Publication costs				£ 20K
Total Kew non-staff costs				**£ 155K**
Total project cost				***£ 432K***

Who at Kew would manage the data?

The main outputs from the project will be:

a) hard copy World Checklist of *Dalbergia* – published in an open access journal;
b) electronic resource World Checklist of *Dalbergia* hosted by freely Kew's Plants of the World Online (POWO) portal;
c) free mobile phone app – hosted by Google Play and Apple Store;
d) updated IUCN extinction risk assessments for all species – hosted by the IUCN;
e) imaged and annotated herbarium specimens hosted on Kew's freely available electronic Herbarium Catalogue (Herb.Cat.);
f) specimens collected on field work in national herbaria in countries of origin and one duplicate in Kew;
g) wood samples generated from field work – housed in Kew's Economic botany collection;
h) DNA samples generated from the molecular lab work housed in Kew's DNA-bank;
i) photos housed in POWO and Kew's image library Digifolia; and
j) line drawings housed in Kew's library and archive collection.