

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



Twenty-seventh meeting of the Plants Committee  
Geneva (Switzerland), 8 – 13 July 2024

Species conservation and trade

Trade in medicinal and aromatic plant species

Report of the Secretariat

ADDENDUM

1. This document has been prepared by the Secretariat.
2. As indicated in paragraph 7 of document [PC27 Doc. 32.1](#), the Secretariat has been working with TRAFFIC and the Royal Botanic Garden Kew to complete the study on international trade in medicinal and aromatic plant species (MAPs) undertaken in accordance with Decision 19.261. Due to the scope and comprehensive nature of the study and the need for further consultation with *inter alia* the specialist on botanical nomenclature and the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) on some aspects of the study, this process could not be concluded before the 27th meeting of the Plants Committee.
3. The Secretariat therefore proposes to circulate the completed study for the consideration of the Plants Committee ahead of the documentation deadline for the 78th meeting of the Standing Committee (SC78) allowing for sufficient time for comments. With the feedback received from the Plants Committee, the Secretariat would then finalize the report and present it for consideration of the Standing Committee at SC78, including reflections on the status of the implementation of Decision 19.261, paragraph c).

**Summary of key results: Study on medicinal and aromatic plant species in international trade**

4. Provisionally, the Secretariat has compiled a summary of key results and main findings, following the structure of the terms of references that the Plants Committee agreed at its 26th meeting (Geneva, June 2023, Annex 1 to document [PC26 Doc. 34 / AC32 Doc. 41, PC26 SR](#)):

*List of CITES-listed MAPs*

5. The CITES Appendices currently contain 34,358 flora species as reflected in the CITES Checklist and Species+, based on listing proposals and standard nomenclature references contained in [Resolution Conf. 12.11 \(Rev. CoP19\)](#) on *Standard nomenclature*. Of these, the Medicinal Plant Name Service (MPNS) V13 contains evidence of medicinal uses for 1,593 CITES-listed plants (see Annex 1 to the present Addendum). As MPNS V13 is focused on flora species with medicinal uses, there could be additional CITES-listed species that fit a wider characterization of MAPs<sup>1</sup> as proposed in document [PC27 Doc. 32.2](#), for example those used exclusively for aromatic or culinary purposes. While about 10% of all vascular plants known to science are also known to be used medicinally, about 4% of CITES-listed flora are known as MAPs, which supports published findings that as a group of taxa, medicinal plants are overall less likely to face conservation threats.

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<sup>1</sup> *Medicinal and Aromatic Plants (MAPs) can be characterized as the group of plant species that are used for therapeutic, aromatic and/or culinary purposes, as components of cosmetics, foods, medicinal products, other natural health products, oils and waxes.*

6. This list of 1,593 CITES-listed MAPs in Annex 1 is based on a full analysis of matches between CITES taxonomy and nomenclature contained in [Resolution Conf. 12.11 \(Rev. CoP19\)](#), and the taxonomy and nomenclature used in MPNS, which is based on nomenclature reflected in the International Plant Names Index (IPNI) and the taxonomy reflected in the World Checklist of Vascular Plants (WCVP). In terms of the nomenclature and taxonomy used in the WCVP, which partially differs from CITES nomenclature and taxonomy, the CITES Appendices include 33,271 plants recognized by WCVP: 33,100 species and 171 of lower taxonomic rank. MPNS V13 has evidence of medicinal uses for 1,408 of these (which equate to 1,593 CITES-listed species in terms of the taxonomy and nomenclature used in CITES databases). On average, these medicinal uses are evidenced by 4.1 references of use for each species. MPNS also has evidence that 368 CITES-listed MAPs are formally regulated as health products by medical or food regulators and are thus expected to be in trade.
7. The taxonomy and nomenclature matching exercise revealed ambiguities and inconsistencies between the two sets of databases used in the study (Species+ and MPNS V13) and included in Annexes 2 to 4 to this addendum. There seems to be:
  - a) names in the CITES databases that do not match any name in WCVP (five separate subgroups are detailed in Annex 2);
  - b) names in the CITES databases that match multiple names in WCVP; and
  - c) species in WCVP that are CITES-listed due to higher taxon listings, but whose names in WCVP appear to be entirely absent from CITES databases.
8. It is unclear which of these ambiguities and inconsistencies derive from standard nomenclature adopted by the Conference of Parties and which may be because of potential errors in the databases and therefore further engagements are required to obtain the clarification needed before the study is finalized.

#### *Analysis of CITES trade data*

9. The trade analysis assessed exporter-reported exports (excluding re-exports) for commercial purposes for the 1,593 CITES-listed MAPs between 2010 and 2022. The CITES Trade Database contains records of trade in 800 CITES-listed MAPs. To only include trade that is likely for MAP purposes, the analysis was refined based on expert knowledge and excludes trade in species and specimens that are likely not traded for MAP purposes (e.g., trade in live specimens and logs, and trade in *Galanthus* spp. roots, which are bulbs primarily traded for horticultural purposes).
10. Using these filters based on expert knowledge in TRAFFIC and the Secretariat, 78 species are reported in commercial trade that is likely traded for MAP purposes, involving a total of 95 million kilogramme, 618,000 litres and 52 million (number of) specimens, mainly dried plants, extracts and derivatives. Most exports by kilogramme (54%) and litres (80%) are wild-sourced. 80% of trade reported by number of specimens (91%) is artificially propagated. Only 250,000 kilogramme (mostly *Prunus africana* bark) is reported as from assisted production (source code Y).
11. Trade volumes in MAPs show a tendency to concentrate in a relatively small number of trade streams (apparently often originating from a relatively small area or one range State), with small numbers of top exporters and importers of CITES listed MAPs, and a small number of highly traded CITES-listed MAPs:
  - a) Twelve CITES listed MAPs account for circa 98% of wild-sourced exports: *Aloe ferox*, *Aloe secundiflora*, *Aquilaria filaria*, *Aquilaria malaccensis*, *Bulnesia sarmientoi*, *Cibotium barometz*, *Cyathea contaminans*, *Dalbergia parviflora*, *Euphorbia antisyphilitica*, *Hoodia gordonii*, *Nardostachys grandiflora* and *Prunus africana*.
  - b) Ten exporting Parties report circa 98% of all exports from the wild: Cameroon, Democratic Republic of the Congo, Indonesia, Kenya, Mexico, Nepal, Paraguay, Uganda and Viet Nam. Twenty importing Parties report circa 90% of all imports from the wild, the top five importers based on all specimens combined are: France, Japan, Saudi Arabia, Taiwan Province of China, and the United States of America. Between 2010 and 2022, the top ten exporting Parties exported an average of two wild-sourced CITES-listed MAPs each, and the top 20 importing Parties imported an average of 6 different wild-sourced species each.

- c) Thirteen species account for 95% of trade in artificially propagated specimens from a small number of top exporters (14 exporters account for 97% of trade) to a small number of top importers (12 importers account for 90% of direct imports). *Aloe ferox* and *Aquilaria malaccensis* are the top species in trade from both wild and artificially propagated sources. Otherwise, the top species in trade from artificial propagation differ from the top species in trade from wild sourced specimens.

#### *Analysis of online trade (e-commerce) and utility of using the MPNS database to analyse e-commerce*

12. An online market survey focused on 15 CITES-listed MAPs of concern<sup>2</sup> was done in two parts: a scoping survey and a baseline survey. The scoping survey was used to assess overall numbers of results using all names for these taxa recorded in MPNS as search keywords, while the baseline survey aimed to record more detailed information on the trade dynamics in MAP products (such as the commodities and countries involved, and the quantity of adverts and products), using a smaller selection of keywords and assessing a random selection of hits manually.
13. To ensure comprehensive and reliable data retrieval and interpretation, all 1,147 scientific, trade, pharmaceutical, drug and common plant names contained in MPNS V13 for these 15 CITES-listed MAPs were used for the scoping survey. The analysis extended to the top five most used online marketplaces globally (AliExpress, Amazon, eBay, Rakuten, and Shopee) and the top five most used social media platforms globally (Douyin, Facebook, Instagram, TikTok and YouTube), and to the five most-spoken languages (English, French, Hindi, Mandarin, and Spanish). The scoping survey found 640 of the 1,147 names contained in MPNS to be used in e-commerce in the five selected languages on the ten selected platforms. For these, the scoping survey returned a total of 68,6 million hits.
14. The baseline survey assessed detailed information of hits for two names of each of the 15 species (one Latin name and one selected trade, pharmaceutical, or common name). Of the 23,751 hits for these 30 names, a random selection of 2,952 hits was assessed in detail, and 312 hits (11%) were categorized as commercial adverts. For more than half of the species (60%), the number of adverts found using the Latin name was higher than the number of adverts found using the second keyword selected from MPNS names.
15. More than half of the adverts refer to products that would currently require CITES permits when traded internationally. If representative of the overall number of hits for all species, this result would indicate a total of 7.5 million commercial adverts for the 15 species among the hits in the scoping survey, of which ca. 3.5 to 4 million should require CITES permits when traded internationally. Yet, there was almost no mention (<1%) of CITES, or any other relevant permit or licence requirements alongside the adverts. No systematic differences could be identified between the number and presentation of adverts that promote products regulated by CITES and products that are exempt through the relevant annotations.

#### *Stakeholder analysis and assessment of annotations*

16. The stakeholder analysis builds on information received in response to Notification to the Parties [No. 2024/056](#) and discussions during a stakeholder webinar with the aim to:
- a) map the generic supply chain(s) of a selected set of CITES-listed MAPs in the biomedical, traditional and alternative medicine, cosmetics and personal care, and food sectors; and
  - b) identify key actors along these supply chains, including producers, intermediate traders, manufacturers, or distribution platforms to end consumers, as well as institutions that influence the demand for CITES-regulated MAPs.
17. The Scientific and Management Authorities of Argentina, Belgium, China, Mexico, and the United Kingdom of Great Britain and Northern Ireland, and five industry stakeholders involved in the trade of MAPs, submitted responses to the Notification. A total of 127 participants, including representatives of CITES authorities, non-governmental organizations and industry contributed to the webinar, to supplement information received in response to the Notification.

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<sup>2</sup> The 15 CITES listed MAPs were identified to be of particular concern based on legal trade volumes, source of specimens commercially traded [wild (W), assisted production (Y) and unknown sources (U)], information relating to illegal trade, the number of non-scientific names under which the species are known (MPNS database), and the species conservation status. For 8 of these, finished products ready for retail trade are currently regulated under their respective listing annotations.

18. Based on the knowledge and interests of Scientific Authorities that responded to Notification [No. 2024/056](#), and on the expertise of webinar participants, the study compiles information on key stakeholders in MAP supply chains and those influencing trade in *Dendrobium nobile*, *Dendrobium* spp., *Nardostachys grandiflora*, *Cactaceae* spp., *Picrorhiza kurroa*, *Euphorbia antisiphilitica*, *Bulnesia sarmientoi*, *Prunus africana*, and *Rhodiola rosea*.
19. Submissions to the Notification and observations made during the webinar highlighted the complexity of many MAP trade chains and the lack of transparency and knowledge gaps about trade chains. The webinar discussions also confirmed that, as indicated by the small number of trade chains that are high volume from a small number of top exporting range States, main harvests often concentrate in relatively small areas or one range State.
20. It is also noted that because the CITES Trade Database mostly contains information on trade that is regulated under CITES, but not any information relating to trade streams already exempted from CITES regulation through the relevant annotations, it cannot be used to fully confirm whether listing annotations are adequately covering trade streams that dominate international trade in line with the criteria in Resolution Conf. 11.21 (Rev. CoP19) on the *Use of annotations in Appendices I and II*. The analysis of e-commerce indicates that the number of adverts for specimens of CITES-listed species that are regulated through annotations is similar to the number of adverts for specimens that are exempted from CITES regulation and that adverts do not indicate whether trade is regulated or not. Feedback on annotations through the stakeholder analysis focused on enforcement and implementation challenges. These included difficulties in interpreting annotations, including challenges related to labels on products that may use common names instead of scientific names, or names in different languages that require interpretation.

#### **Secretariat's reflections on next steps**

21. To the best knowledge of the Secretariat, the matching exercise represents the first ever complete comparison of the taxonomy and nomenclature in the CITES Checklist and Species+ databases with an authoritative external source of global flora species (i.e., WCVP). Through the matching exercise, ambiguities and differences between the two databases have been compiled and documented. The nomenclature specialist of the Plants Committee has agreed to consider these to identify, in collaboration with the Secretariat and UNEP-WCMC, which of these warrant corrections, and to prepare proposals for the consideration of the Plants Committee, as appropriate. This review will require further work in the next intersessional period.
22. The list of CITES-listed MAPs also enables the Secretariat, subject to external funding, to work with UNEP-WCMC to implement cross-references from the CITES Checklist and Species+ databases to the MPNS for MAPs, with appropriate disclaimers, as agreed by PC26 (see summary record [PC26 SR](#)).
23. With regards to the applicability of using the Medicinal Plant Names Service (MPNS) database in the analysis [Decision 19.261, paragraph c)], the Secretariat considers that the analysis has highlighted benefits and challenges of using the MPNS database for trade analyses and trade monitoring, which can be informative for Parties and observers who may consider using similar approaches in the future. These include:
  - a) Benefits:
    - i) An authoritative source, with comprehensive and transparent referencing, for defining the group of taxa used for medicinal and aromatic purposes, based on updated nomenclature and taxonomy in WCVP and IPNI consistent with current scientific knowledge;
    - ii) Availability of sets of names in various languages that allow to broaden trade monitoring, especially to better understand e-commerce in CITES-listed MAPs, and to identify large numbers of online adverts that would require CITES permits if traded internationally.
  - b) Challenges:
    - i) The number of trade, common, and pharmaceutical names available in MPNS, some of which can potentially refer to a variety of biological species, thus requiring careful definition of relevant and unambiguous keywords for researching e-commerce;

- ii) The sheer number of results, even when only done for 15 species (ca. 68 million), and even when considering only estimates of the share of these likely to be commercial adverts (ca. 7.5 million) that require CITES permits when traded internationally (ca. 3.5 – 4 million).
24. The analysis of the CITES trade database for the 1,593 MAPs illustrates that the majority of trade in CITES-listed MAPs, in terms of trade volumes, appears to concentrate in a small number of trade streams that appear to mostly originate from relatively small areas or individual range States; predominantly affect a small number of species; and mainly involve a small number of key exporting and importing Parties (see paragraph 11). This insight provides a useful option to review these key trade streams in follow-up work in-depth, where not already covered by recent work under other CITES Decisions.
25. Regarding the stakeholder analysis of key producers, intermediate traders, manufacturers or distribution platforms to end consumers, and of institutions influencing the demand for CITES-regulated MAP products in biomedical, traditional and alternative medical systems, cosmetic and personal care, food industries (as appropriate) [Decision 19.261, paragraph c i)], the study provides useful information on key stakeholders for species and trade streams that were selected based on the knowledge and interests of Scientific Authorities that responded to Notification to the Parties [No. 2024/056](#), and of participants of the webinar. If considered useful, more in-depth work could be warranted to focus on key stakeholders of those trade chains that were identified in the trade analysis and those that dominate international trade in CITES-listed MAPs (see paragraph 11 of the present Addendum).
26. The Secretariat proposes that the Plants Committee submit the following draft decisions for consideration by the 20th meeting of the Conference of the Parties to complete the work described in paragraphs 21 and 22 in the next intersessional period, noting that some of these activities could be deleted from these draft decisions, if they are completed before CoP20:

***Directed to the Secretariat***

**20.AA** *The Secretariat shall:*

- a) *work with the nomenclature specialist of the Plants Committee and the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) to identify any corrections or improvements to the nomenclature in CITES databases, based on the findings of the study on international trade in medicinal and aromatic plant species (MAPs);*
- b) *subject to external funding, implement cross-references between CITES databases and the Medicinal Plant Names database for CITES-listed MAPs, taking into account the technical advice of the Plants Committee agreed at its 26th meeting (see summary record [PC26 SR](#)); and*
- c) *report to the Plants Committee.*

***Directed to the Plants Committee***

**20.BB** *The Plants Committee shall review the report submitted by the Secretariat in accordance with Decision 20.AA; and report to the Conference of the Parties.*

Recommendations:

27. The Plants Committee is invited to:
- a) provide feedback on:
    - i) the progress in implementing Decision 19.261;
    - ii) the proposal to circulate the completed study for the consideration of the Plants Committee ahead of the documentation deadline for the 78th meeting of the Standing Committee (SC78) allowing for sufficient time for comments as described in paragraph 3 of the present Addendum;
    - iii) the proposed next steps detailed in paragraphs 21 to 25 of the present Addendum; and
    - iv) the draft decisions proposed in paragraph 26 of the present Addendum.

- b) formulate recommendations to the Standing Committee or the Conference of the Parties, as appropriate.

NAMES FROM THE CITES CHECKLIST / SPECIES+  
WHICH DO NOT MATCH TO ANY UNIQUE SCIENTIFIC NAME IN WCVF

**GROUP 1:** Names for which the combination of genus + specific epithet does not exist in WCVF (30 names).

CITES name (cleaned for matching)
<i>Aloe qaharensis</i> Lavranos & Collen.
<i>Angraecum minutissimum</i> A.Chev.
<i>Angraecum nzoanum</i> A.Chev.
<i>Angraecum pygmaeum</i> Linden
<i>Bulbophyllum monteroi</i> J.E.Leite
<i>Bulbophyllum oertlei</i> Sieder.
<i>Bulbophyllum schultzeanum</i> Schltr.
<i>Bulbophyllum staintonii</i> Tuyama
<i>Bulbophyllum vöthii</i> Sieder
<i>Calanthe oodaruma</i> Maekawa
<i>Catasetum caputinum</i> da Silva
<i>Catasetum vibritile</i> (Bass.) Cpm.
<i>Cephalocereus laui</i>
<i>Cleisostoma macrostachyum</i> Teijsm. & Binn.
<i>Cyathea goudeyi</i> D.L.Jones
<i>Cyathea mello-baroetoi</i> (Brade) comb.ined.
<i>Cyathea portoana</i> (Brade) comb.ined.
<i>Cyathea raiaateensis</i> (J.W.Moore) comb.ined.
<i>Dalbergia benthamiana</i> (Kuntze) E.V.Williams, Govaerts & Vatanp.
<i>Dendrobium argiense</i> J.J.Sm.
<i>Encephalartos powysorum</i> Beentje
<i>Euphorbia dentonii</i> hort. ex Anon.
<i>Laelia pabstii</i> Ghillany
<i>Miltonia castanea</i> Rolfe
<i>Papilionanthe masperuae</i> (Kerr) Garay
<i>Phalaenopsis schiller-stuartiana</i> Rolfe
<i>Rhynchosstele costaricensis</i> Schltr.
<i>Sigmatostalix ibis</i> K.S.Walter
<i>Stanhopea acostae</i> Dodson & Escobar
<i>Zamia biserrulata</i> D.Stevenson & Sabato

**GROUP 2:** Names that were found to have no possible direct match to any scientific name in WCVF but for which it was possible to infer suggestions for scientific names having similar but different genus or species epithets from WCVF.

CITES name (cleaned for matching)	Possible WCVF matches found (different authors)	Accepted name of WCVF match
<i>Cyathea monilifera</i> (J.Sm.) comb.ined.	<i>Cyathea moniliformis</i> Jenman	<i>Sphaeropteris insignis</i> (D.C.Eaton) R.M.Tryon
<i>Encyclia cepiforme</i> Hooker	<i>Epidendrum cepiforme</i> Hook.	<i>Encyclia candollei</i> (Lindl.) Schltr.

<i>Encyclia singuliflorum</i> Schltr.	<i>Epidendrum singuliflorum</i> Schltr.	<i>Epidendrum singuliflorum</i> Schltr.
<i>Phalaenopsis emersonii</i> Koop & P.J.Cribb	<i>Paphiopedilum emersonii</i> Koop. & P.J.Cribb	<i>Paphiopedilum emersonii</i> Koop. & P.J.Cribb

**GROUP 3:** Names for which the combination of genus + specific epithet was found in WCVP, but for which the authority of the name provided differs from that in WCVP, and for which no evidence was found to indicate the two names referred to the same plant (37 names).

<b>CITES name</b> (cleaned for matching)	<b>Possible WCVP matches found</b> (different authors)	<b>Accepted name of WCVP match</b>
<i>Acianthera erosa</i> (Garay) ined.	<i>Acianthera erosa</i> (Urb.) A.Doucette	<i>Acianthera erosa</i> (Urb.) A.Doucette
<i>Acrolophia cochlearis</i> (L.) W.T.Aiton	<i>Acrolophia cochlearis</i> (Lindl.) Schltr. & Bolus	<i>Eulophia cochlearis</i> Lindl.
<i>Aloe succotrina</i> All.	<i>Aloe succotrina</i> Weston	<i>Aloe succotrina</i> Weston
<i>Aquilaria apiculata</i> Elmer	<i>Aquilaria apiculata</i> Merr.	<i>Aquilaria apiculata</i> Merr.
<i>Baskervilla paranaensis</i> (Porsch) Garay	<i>Baskervilla paranaensis</i> (Kraenzl.) Schltr.	<i>Baskervilla paranaensis</i> (Kraenzl.) Schltr.
<i>Brachionidium folsomii</i> Luer	<i>Brachionidium folsomii</i> Dressler	<i>Brachionidium folsomii</i> Dressler
<i>Brachionidium kuhniarum</i> Luer	<i>Brachionidium kuhniarum</i> Dressler	<i>Brachionidium kuhniarum</i> Dressler
<i>Caladenia huegelii</i> Hopper & A.P.Brown ms.	<i>Caladenia huegelii</i> Rchb.f.	<i>Caladenia huegelii</i> Rchb.f.
<i>Chloraea venosa</i> Griseb.	<i>Chloraea venosa</i> Rchb.f.	<i>Chloraea venosa</i> Rchb.f.
<i>Cyathea crassa</i> (Karst.) comb. ined.	<i>Cyathea crassa</i> Maxon	<i>Alsophila jimeneziana</i> D.S.Conant
<i>Cylindropuntia fulgida</i> Ritter	<i>Cylindropuntia fulgida</i> (Engelm.) F.M.Knuth	<i>Cylindropuntia fulgida</i> (Engelm.) F.M.Knuth
<i>Diuris aequalis</i> H.G.Reichb.	<i>Diuris aequalis</i> F.Muell. ex Fitzg.	<i>Diuris aequalis</i> F.Muell. ex Fitzg.
<i>Euphorbia grandicornis</i> Goebel	<i>Euphorbia grandicornis</i> Blanc	<i>Euphorbia grandicornis</i> Blanc
<i>Euphorbia waringiae</i> N.E.Brown	<i>Euphorbia waringiae</i> Rauh & Gerold	<i>Euphorbia waringiae</i> Rauh & Gerold
<i>Graphorkis scripta</i> Lindl.	<i>Graphorkis scripta</i> (Thouars) Kuntze	<i>Graphorkis concolor</i> var. <i>alphabetica</i> F.N.Rasm.
<i>Habenaria carnea</i> N.E. Br.	<i>Habenaria carnea</i> Gower	<i>Habenaria carnea</i> Gower
<i>Habenaria oerstedii</i> S.Misra	<i>Habenaria oerstedii</i> Rchb.f.	<i>Habenaria oerstedii</i> Rchb.f.
<i>Laelia gottoiana</i> Hort.	<i>Laelia</i> × <i>gottoana</i> G.Gordon	<i>Cattleya</i> × <i>gottoana</i> (G.Gordon) J.M.H.Shaw
<i>Lepanthes mairae</i> D.E.Benn. & Christenson	<i>Lepanthes mariae</i> Salazar, Soto Arenas & O.Suárez	<i>Lepanthes mariae</i> Salazar, Soto Arenas & O.Suárez
<i>Lepanthes moorei</i> Salazar & Soto Arenas	<i>Lepanthes moorei</i> C.Schweinf.	<i>Lepanthes moorei</i> C.Schweinf.
<i>Lepanthes ovalis</i> Rchb.f.	<i>Lepanthes ovalis</i> (Sw.) Fawc. & Rendle	<i>Lepanthes ovalis</i> (Sw.) Fawc. & Rendle
<i>Maxillaria fletcheriana</i> Rolfe	<i>Maxillaria fletcheriana</i> J.G.Fowler	<i>Maxillaria fletcheriana</i> J.G.Fowler
<i>Melocactus inconcinus</i> Ritter	<i>Melocactus inconcinus</i> Buining & Brederoo	<i>Melocactus inconcinus</i> Buining & Brederoo
<i>Mormodes colossus</i> (Kraenzl.) Mansf.	<i>Mormodes colossus</i> Rchb.f.	<i>Mormodes colossus</i> Rchb.f.



<i>Nidema ottonis</i> Ames & C.Schweinf.	<i>Nidema ottonis</i> (Rchb.f.) Britton & Millsp.	<i>Nidema ottonis</i> (Rchb.f.) Britton & Millsp.
<i>Operculicarya pachypus</i> H. Perrier	<i>Operculicarya pachypus</i> Eggl	<i>Operculicarya pachypus</i> Eggl
<i>Opuntia engelmannii</i> (Griffiths) Parfitt & Pinkava	<i>Opuntia engelmannii</i> Salm-Dyck ex Engelm.	<i>Opuntia engelmannii</i> Salm-Dyck ex Engelm.
<i>Papilionanthe teres</i> (Lindley) Garay	<i>Papilionanthe teres</i> (Roxb.) Schltr.	<i>Papilionanthe teres</i> (Roxb.) Schltr.
<i>Pholidota imbricata</i> Lindley	<i>Pholidota imbricata</i> Hook.	<i>Coelogyne imbricata</i> (Hook.) Rchb.f.
<i>Spathoglottis confusa</i> Schltr.	<i>Spathoglottis confusa</i> J.J.Sm.	<i>Spathoglottis confusa</i> J.J.Sm.
<i>Summerhayesia laurentii</i> Ames & C.Schweinf.	<i>Summerhayesia laurentii</i> (De Wild.) P.J.Cribb	<i>Summerhayesia laurentii</i> (De Wild.) P.J.Cribb
<i>Thelasis micrantha</i> (A.S.George) M.A.Clem. & D.L.Jones	<i>Thelasis micrantha</i> (Brongn.) J.J.Sm.	<i>Thelasis micrantha</i> (Brongn.) J.J.Sm.
<i>Thrixspermum subulatum</i> (Dod) Nir	<i>Thrixspermum subulatum</i> (Blume) Rchb.f.	<i>Thrixspermum subulatum</i> (Blume) Rchb.f.
<i>Tropidia curculigoides</i> Blume	<i>Tropidia curculigoides</i> Lindl.	<i>Tropidia curculigoides</i> Lindl.
<i>Uncarina grandidieri</i> H. Humbert	<i>Uncarina grandidieri</i> (Baill.) Stapf	<i>Uncarina grandidieri</i> (Baill.) Stapf
<i>Zamia atropurpurea</i> D.Stevenson	<i>Zamia atropurpurea</i> J.Parm.	<i>Ceratozamia mexicana</i> Brongn.
<i>Zygosityos pubescens</i> Beentje.	<i>Zygosityos pubescens</i> (Keraudren) G.D.Rowley	<i>Xerosicyos pubescens</i> Keraudren

**GROUP 4:** Names for which the combination of genus + specific epithet was found to match two scientific names in WCVF each of which have different authors from the CITES name. No evidence was found to indicate that either of these scientific names might refer to the same plant (**1 name**).

CITES name (cleaned for matching)	Possible WCVF matches found (different authors)	Accepted name of WCVF match
<i>Euphorbia trigona</i> Haw.	<i>Euphorbia trigona</i> Mill.	<i>Euphorbia trigona</i> Mill.
	<i>Euphorbia trigona</i> Roxb.	<i>Euphorbia lacei</i> Craib

**GROUP 5:** Names for which the combination of genus + specific epithet was not found to perfectly match WCVF but a very similar combination with same genus but different (but similar) epithet, published by the same authors was found (**5 names**). Combination genus + specific epithet + author found but the name in CITES list indicates a cultivar (**1 name**).

CITES name (cleaned for matching)	Possible WCVF matches found (different authors)	Accepted name of WCVF match
<i>Galanthus nivalis</i> "flore pleno" L.	<i>Galanthus nivalis</i> L.	<i>Galanthus nivalis</i> L.
<i>Echinocereus pamanesii</i> A.B.Lau	<i>Echinocereus pamanesiorum</i> A.B.Lau	<i>Echinocereus pamanesiorum</i> A.B.Lau
<i>Euphorbia lambii</i> Svent.	<i>Euphorbia lambiorum</i> Svent.	<i>Euphorbia bourgeana</i> J.Gay ex Boiss.
<i>Dendrochilum javieriense</i> Magrath, Bulmer & I.Shafer	<i>Dendrochilum javierianum</i> Magrath, Bulmer & I.Shafer	<i>Coelogyne javieriana</i> (Magrath, Bulmer & I.Shafer) M.W.Chase & Schuit.
<i>Ponera alata</i> Rchb.f.	<i>Ponera striolata</i> Rchb.f.	<i>Scaphyglottis modesta</i> (Rchb.f.) Schltr.
<i>Vanilla wightiana</i> Lindley ex Hook.f.	<i>Vanilla wightii</i> Lindl. ex Wight	<i>Vanilla wightii</i> Lindl. ex Wight

CITES-LISTED PLANTS IN WCVF  
RELATING TO MULTIPLE SPECIES SCIENTIFIC NAMES IN SPECIES+

Accepted name of CITES-listed MAPs in MPNS	Count of scientific names in Species+ considered synonyms in WCVF
<i>Euphorbia rhombifolia</i> Boiss.	11
<i>Oberonia scortechinii</i> Hook.f.	11
<i>Epipactis helleborine</i> subsp. <i>helleborine</i>	9
<i>Oberonia equitans</i> (G.Forst.) Mutel	9
<i>Euphorbia crassipes</i> Marloth	5
<i>Euphorbia flanaganii</i> N.E.Br.	5
<i>Cyathea phalerata</i> Mart.	4
<i>Dalbergia junghuhnii</i> Benth.	4
<i>Euphorbia burmanni</i> E.Mey. ex Boiss.	4
<i>Gonystylus macrophyllus</i> (Miq.) Airy Shaw	4
<i>Spathoglottis parviflora</i> Kraenzl.	4
<i>Aquilaria filaria</i> (Oken) Merr.	3
<i>Coelogyne chinensis</i> (Lindl.) Rchb.f.	3
<i>Dalbergia pervillei</i> Vatke	3
<i>Dendrobium appendiculatum</i> (Blume) Lindl.	3
<i>Dendrobium pachyphyllum</i> (Kuntze) Bakh.f.	3
<i>Epipactis persica</i> (Soó) Hausskn. ex Nannf.	3
<i>Euphorbia racemosa</i> E.Mey. ex Boiss.	3
<i>Euphorbia tenax</i> Burch.	3
<i>Goodyera brachystegia</i> Hand.-Mazz.	3
<i>Oberonia mucronata</i> (D.Don) Ormerod & Seidenf.	3
<i>Plocoglottis lowii</i> Rchb.f.	3
<i>Spathoglottis plicata</i> Blume	3
<i>Spiranthes australis</i> (R.Br.) Lindl.	3
<i>Vanilla phaeantha</i> Rchb.f.	3
<i>Vanilla planifolia</i> Andrews	3
<i>Aerides rosea</i> Lodd. ex Lindl. & Paxton	2
<i>Aloe fleurentinorum</i> Lavranos & L.E.Newton	2
<i>Aloe littoralis</i> Baker	2
<i>Aloe parvibracteata</i> Schönland	2
<i>Aloe rivierei</i> Lavranos & L.E.Newton	2
<i>Anacamptis coriophora</i> (L.) R.M.Bateman, Pridgeon & M.W.Chase	2
<i>Anacamptis laxiflora</i> (Lam.) R.M.Bateman, Pridgeon & M.W.Chase	2
<i>Anacamptis morio</i> (L.) R.M.Bateman, Pridgeon & M.W.Chase	2
<i>Anacamptis papilionacea</i> (L.) R.M.Bateman, Pridgeon & M.W.Chase	2
<i>Aquilaria hirta</i> Ridl.	2
<i>Aquilaria malaccensis</i> Lam.	2
<i>Aquilaria sinensis</i> (Lour.) Spreng.	2

<i>Bulbophyllum leopardinum</i> (Wall.) Lindl. ex Wall.	2
<i>Bulbophyllum lepidum</i> (Blume) J.J.Sm.	2
<i>Bulbophyllum pecten-veneris</i> (Gagnep.) Seidenf.	2
<i>Calanthe triplicata</i> (Willemet) Ames	2
<i>Calanthe vestita</i> Wall. ex Lindl.	2
<i>Coelogyne leucantha</i> W.W.Sm.	2
<i>Corymborkis veratrifolia</i> (Reinw.) Blume	2
<i>Crepidium purpureum</i> (Lindl.) Szlach.	2
<i>Cyathea lasiosora</i> (Kuhn) Domin	2
<i>Cycas revoluta</i> Thunb.	2
<i>Dactylorhiza incarnata</i> subsp. <i>cilicica</i> (Klinge) H.Sund.	2
<i>Dalbergia cochinchinensis</i> Pierre	2
<i>Dalbergia greveana</i> Baill.	2
<i>Dalbergia parviflora</i> Roxb.	2
<i>Dalbergia rimosa</i> Roxb.	2
<i>Dalbergia rostrata</i> Hassk.	2
<i>Dendrobium chrysotoxum</i> Lindl.	2
<i>Dendrobium dactyloides</i> Rchb.f.	2
<i>Dendrobium denneanum</i> Kerr	2
<i>Dendrobium fimbriatum</i> Hook.	2
<i>Dendrobium moniliforme</i> (L.) Sw.	2
<i>Dendrobium moschatum</i> (Banks) Sw.	2
<i>Dendrobium nanum</i> Hook.f.	2
<i>Dendrobium salaccense</i> (Blume) Lindl.	2
<i>Dendrobium xantholeucum</i> Rchb.f.	2
<i>Dienia ophrydis</i> (J.Koenig) Seidenf.	2
<i>Dipteryx odorata</i> (Aubl.) Forsyth f.	2
<i>Dipteryx oleifera</i> Benth.	2
<i>Eulophia clitelifera</i> (Rchb.f.) Bolus	2
<i>Eulophia dabia</i> (D.Don) Hochr.	2
<i>Euphorbia antiquorum</i> L.	2
<i>Euphorbia caerulescens</i> Haw.	2
<i>Euphorbia clavigera</i> N.E.Br.	2
<i>Euphorbia comosa</i> Vell.	2
<i>Euphorbia davyi</i> N.E.Br.	2
<i>Euphorbia grandidens</i> Haw.	2
<i>Euphorbia khandallensis</i> Blatt. & Hallb.	2
<i>Euphorbia knobelii</i> Letty	2
<i>Euphorbia lacei</i> Craib	2
<i>Euphorbia larica</i> Boiss.	2
<i>Euphorbia procumbens</i> Mill.	2
<i>Euphorbia sessiliflora</i> Roxb.	2
<i>Euphorbia transvaalensis</i> Schltr.	2
<i>Euphorbia tuberosa</i> L.	2
<i>Gastrochilus distichus</i> (Lindl.) Kuntze	2
<i>Gonystylus bancanus</i> (Miq.) Kurz	2
<i>Goodyera schlechtendaliana</i> Rchb.f.	2
<i>Grammatophyllum scriptum</i> (L.) Blume	2

<i>Gymnadenia nigra</i> (L.) Rchb.f.	2
<i>Habenaria dentata</i> (Sw.) Schltr.	2
<i>Himantoglossum caprinum</i> (M.Bieb.) Spreng.	2
<i>Himantoglossum robertianum</i> (Loisel.) P.Delforge	2
<i>Lecanorchis malaccensis</i> Ridl.	2
<i>Liparis condylobulbon</i> Rchb.f.	2
<i>Liparis viridiflora</i> (Blume) Lindl.	2
<i>Neotinea tridentata</i> (Scop.) R.M.Bateman, Pridgeon & M.W.Chase	2
<i>Neotinea ustulata</i> (L.) R.M.Bateman, Pridgeon & M.W.Chase	2
<i>Nepenthes mirabilis</i> (Lour.) Druce	2
<i>Nervilia plicata</i> (Andrews) Schltr.	2
<i>Oberonia caulescens</i> Lindl.	2
<i>Opuntia elatior</i> Mill.	2
<i>Opuntia fragilis</i> (Nutt.) Haw.	2
<i>Orchis anatolica</i> Boiss.	2
<i>Pachystoma pubescens</i> Blume	2
<i>Phalaenopsis deliciosa</i> Rchb.f.	2
<i>Phalaenopsis difformis</i> (Wall. ex Lindl.) Kocyan & Schuit.	2
<i>Pinalia bractescens</i> (Lindl.) Kuntze	2
<i>Pleione bulbocodioides</i> (Franch.) Rolfe	2
<i>Psychilis bifida</i> (Aubl.) Saulea	2
<i>Rhipidoglossum millarii</i> (Bulus) Farminhão & Stévar	2
<i>Spathoglottis papuana</i> F.M.Bailey	2
<i>Sphaeropteris brunoniana</i> (Wall. ex Hook.) R.M.Tryon	2
<i>Sphaeropteris medullaris</i> (G.Forst.) Bernh.	2
<i>Spiranthes sinensis</i> (Pers.) Ames	2
<i>Taxus wallichiana</i> Zucc.	2
<i>Thrixspermum filiforme</i> (Hook.f.) Kuntze	2
<i>Vanda concolor</i> Blume	2
<i>Vanilla pompona</i> Schiede	2

CURRENTLY ACCEPTED NAMES IN THE WCVF FOR CITES-LISTED MAPS  
THAT ARE ENTIRELY ABSENT FROM THE CITES DATABASES

The following 109 plants (7.7% of the CITES-listed MAPs in Species+) are listed in Species+ but will not be found if you search using the currently accepted botanical name according to the WCVF.

Accepted names of MAPs in MPNS found to be absent from Species+
<i>Acampe praemorsa</i> var. <i>longepedunculata</i> (Trimen) Govaerts
<i>Acampe praemorsa</i> var. <i>praemorsa</i>
<i>Airampoa soehrensii</i> (Britton & Rose) Lodé
<i>Aloe perfoliata</i> L.
<i>Aloiampelos ciliaris</i> (Haw.) Klopper & Gideon F.Sm.
<i>Aloiampelos gracilis</i> (Haw.) Klopper & Gideon F.Sm.
<i>Aloiampelos striatula</i> (Haw.) Klopper & Gideon F.Sm.
<i>Aloiampelos tenuior</i> (Haw.) Klopper & Gideon F.Sm.
<i>Aloidendron barberae</i> (Dyer) Klopper & Gideon F.Sm.
<i>Aloidendron dichotomum</i> (Masson) Klopper & Gideon F.Sm.
<i>Aloidendron pillansii</i> (L.Guthrie) Klopper & Gideon F.Sm.
<i>Aloidendron ramosissimum</i> (Pillans) Klopper & Gideon F.Sm.
<i>Aloidendron sabaeum</i> (Schweinf.) Boatwr. & J.C.Manning
<i>Alsophila celsa</i> R.M.Tryon
<i>Alsophila dregei</i> (Kunze) R.M.Tryon
<i>Alsophila firma</i> (Baker) D.S.Conant
<i>Alsophila manniana</i> (Hook.) R.M.Tryon
<i>Alsophila nilgirensis</i> (Holtum) R.M.Tryon
<i>Alsophila spinulosa</i> (Wall. ex Hook.) R.M.Tryon
<i>Alsophila tricolor</i> (Colenso) R.M.Tryon
<i>Anacampseros rhodesica</i> N.E.Br.
<i>Aristaloe aristata</i> (Haw.) Boatwr. & J.C.Manning
<i>Bambuseria bambusifolia</i> (Lindl.) Schuit., Y.P.Ng & H.A.Pedersen
<i>Chrysalidocarpus decipiens</i> Becc.
<i>Cochemiea grahamii</i> (Engelm.) Doweld
<i>Coelogyne alba</i> (Lindl.) Rchb.f.
<i>Coelogyne articulata</i> (Lindl.) Rchb.f.
<i>Coelogyne cantonensis</i> (Rolfe) R.Rice
<i>Coelogyne chinensis</i> (Lindl.) Rchb.f.
<i>Coelogyne fusca</i> (Lindl.) Rchb.f.
<i>Coelogyne kouytcheensis</i> (Gagnep.) M.W.Chase & Schuit.
<i>Coelogyne pallida</i> (Lindl.) Rchb.f.
<i>Coelogyne porrecta</i> (Lindl.) Rchb.f.
<i>Crepidium versicolor</i> (Lindl.) Sushil K.Singh, Agrawala & Jalal
<i>Cylindropuntia imbricata</i> subsp. <i>rosea</i> (DC.) M.A.Baker
<i>Cynanchum viminalis</i> subsp. <i>suberosum</i> (Meve & Liede) Goyder
<i>Cyrtosia lindleyana</i> Hook.f. & Thomson
<i>Dactylorhiza incarnata</i> subsp. <i>cilicica</i> (Klinge) H.Sund.
<i>Dactylorhiza incarnata</i> subsp. <i>incarnata</i>

<i>Dalbergia horrida</i> var. <i>horrida</i>
<i>Dalbergia millettii</i> var. <i>mimosoides</i> (Franch.) Thoth.
<i>Dalbergia ovata</i> var. <i>obtusifolia</i> Baker
<i>Dalbergia pinnata</i> var. <i>pinnata</i>
<i>Dendrobium hymenanthum</i> Rchb.f.
<i>Dolomiaea costus</i> (Falc.) Kasana & A.K.Pandey
<i>Epipactis helleborine</i> subsp. <i>helleborine</i>
<i>Epipactis persica</i> (Soó) Hausskn. ex Nannf.
<i>Eulophia maculata</i> (Lindl.) Rchb.f.
<i>Eulophia picta</i> (R.Br.) Ormerod
<i>Eulophia recurva</i> (Roxb.) M.W.Chase, Kumar & Schuit.
<i>Euphorbia grandifolia</i> Haw.
<i>Euphorbia murielii</i> N.E.Br.
<i>Euphorbia officinarum</i> subsp. <i>echinus</i> (Hook.f. & Coss.) Vindt
<i>Euphorbia procumbens</i> Mill.
<i>Euphorbia racemosa</i> E.Mey. ex Boiss.
<i>Gonialoe variegata</i> (L.) Boatwr. & J.C.Manning
<i>Gymnosphaera andersonii</i> (J.Scott ex Bedd.) Ching & S.K.Wu
<i>Gymnosphaera capensis</i> (L.f.) S.Y.Dong
<i>Gymnosphaera gigantea</i> (Wall. ex Hook.) S.Y.Dong
<i>Gymnosphaera khasyana</i> (T.Moore ex Kuhn) Ching
<i>Gymnosphaera lurida</i> (Blume) S.Y.Dong
<i>Harrisia bonplandii</i> (J.Parm. ex Pfeiff.) Britton & Rose
<i>Hemipilia chusua</i> (D.Don) Y.Tang & H.Peng
<i>Hemipilia cucullata</i> (L.) Y.Tang, H.Peng & T.Yukawa
<i>Hemipilia gracilis</i> (Blume) Y.Tang, H.Peng & T.Yukawa
<i>Hemipilia pinguicula</i> (Rchb.f. & S.Moore) Y.Tang & H.Peng
<i>Hemipilia simplex</i> (Tang & F.T.Wang) Y.Tang & H.Peng
<i>Isolatocereus dumortieri</i> (Scheidw.) Backeb.
<i>Kumara plicatilis</i> (L.) G.D.Rowley
<i>Leucostele terscheckii</i> (J.Parm. ex Pfeiff.) Schlumpb.
<i>Leucostele werdermanniana</i> (Backeb.) Schlumpb.
<i>Lophocereus marginatus</i> (DC.) S.Arias & Terrazas
<i>Lophocereus schottii</i> (Engelm.) Britton & Rose
<i>Lophosoria quadripinnata</i> (J.F.Gmel.) C.Chr.
<i>Melocactus pruinosus</i> Werderm.
<i>Mengzia foliosa</i> (King & Pantl.) W.C.Huang, Z.J.Liu & C.Hu
<i>Microchilus kuczynskii</i> (Porsch) E.C.Smidt & M.W.Chase
<i>Nardostachys jatamansi</i> (D.Don) DC.
<i>Nervilia simplex</i> (Thouars) Schltr.
<i>Oberonia scortechinii</i> Hook.f.
<i>Ophrys holosericea</i> subsp. <i>holosericea</i>
<i>Ophrys lutea</i> subsp. <i>galilaea</i> (H.Fleischm. & Bornm.) Soó
<i>Ophrys scolopax</i> subsp. <i>phrygia</i> (H.Fleischm. & Bornm.) H.A.Pedersen & P.J.Cribb
<i>Ophrys sphegodes</i> var. <i>transhyrcana</i> (Czerniak.) P.J.Cribb
<i>Pelecyphora vivipara</i> (Nutt.) D.Aquino & Dan.Sánchez
<i>Plectrocarpa sarmientoi</i> (Lorentz ex Griseb.) Christenh. & Byng
<i>Porlieria angustifolia</i> (Engelm.) A.Gray

<i>Rhipsalidopsis gaertneri</i> (Regel) Linding.
<i>Salmonopuntia salmiana</i> (J.Parm. ex Pfeiff.) P.V.Heath
<i>Sarcocaulon patersonii</i> (DC.) G.Don
<i>Selenicereus guatemalensis</i> (Eichlam ex Weing.) D.R.Hunt
<i>Selenicereus megalanthus</i> (K.Schum. ex Vaupel) Moran
<i>Selenicereus triangularis</i> (L.) D.R.Hunt
<i>Selenicereus undatus</i> (Haw.) D.R.Hunt
<i>Soehrensia arboricola</i> (Kimmach) Schlumpb.
<i>Sphaeropteris albosetacea</i> (Bedd.) R.M.Tryon
<i>Sphaeropteris angiensis</i> (A.Gepp) R.M.Tryon
<i>Sphaeropteris brunoniana</i> (Wall. ex Hook.) R.M.Tryon
<i>Sphaeropteris crinita</i> (Hook.) R.M.Tryon
<i>Sphaeropteris glauca</i> (Blume) R.M.Tryon
<i>Sphaeropteris medullaris</i> (G.Forst.) Bernh.
<i>Spiranthes australis</i> (R.Br.) Lindl.
<i>Strongyleria pannea</i> (Lindl.) Schuit., Y.P.Ng & H.A.Pedersen
<i>Taxus contorta</i> Griff.
<i>Thelasis micrantha</i> (Brongn.) J.J.Sm.
<i>Thunia alba</i> var. <i>alba</i>
<i>Trichocereus macrogonus</i> var. <i>pachanoi</i> (Britton & Rose) Albesiano & R.Kiesling
<i>Xiquexique gounellei</i> (F.A.C.Weber ex K.Schum.) LAVOR & Calvente
<i>Xiquexique tuberculatus</i> (Werderm.) LAVOR & Calvente