

Deletion of *Ceropegia* spp. from Appendix II. Proponent: Swiss Confederation.

Summary: The genus *Ceropegia* (commonly known as Lantern Flowers) comprises over 200 species distributed over most of Africa, Madagascar, the Arabian Peninsula, the Indian Subcontinent, the Far East and into the northern part of Australia. They occur in a wide range of habitats from equatorial forest to semi-desert, but are not found in true deserts. They are erect or twining perennial herbs. The rootstock is often a cluster of fleshy (fusiform) roots, a discoid tuber, occasionally an elongated tuber or rhizome, or only has fibrous roots. The stems range from herbaceous to extremely succulent. The genus has been included in CITES Appendix II since 1979. A small number of species are widely grown with some, such as *C. linearis* and its varieties, being popular indoor plants. Most international trade (both volume and number of transactions) is in artificially propagated plants produced in Europe, North America and South Africa. This trade is largely comprised of unnamed taxa, but 46 taxa (17%) are listed in the CITES Annual Reports. The records also do not indicate any preference for tuberous species (18 tuberous taxa, 16 fleshy-rooted and nine fibrous). The CITES Annual Reports indicate 110 cases where the source was not given as artificially propagated, of these 15 were recorded as wild-collected, only three of which were of named species (*C. armandii*, *C. dimorpha*, *C. razafindratsirana* - all from Madagascar). Reports from other sources suggest wild-collected trade in a further seven species (*C. arenaria*, *C. carnososa*, *C. conrathi*, *C. decidua* ssp. *pretoriensis*, *C. fortuita*, *C. imbricata*, *C. stentiae* - all except 1, from South Africa). CITES Annual Report data indicates 12 cases of illegal trade from 1979-1989, in most cases this material is unnamed. There are also indications that some trade in wild-collected plants is not reported. When traded as tubers, *Ceropegia* species cannot be distinguished from species of *Brachystelma*, a closely related genus. *Brachystelma* is not included in the Appendices and there is significant demand for this genus in international trade. *Ceropegia* is protected by national legislation in only a few range States. More than half of the taxa are threatened to some degree, with at least one species having become extinct. The major threats are habitat loss and harvesting of tubers for local consumption as food and medicine. This proposal has been submitted under Resolution Conf. 9.24 on the basis that there is very little international trade in the genus. The Plants Committee has endorsed this proposal.

Analysis: Following Resolution Conf. 9.24, it does not appear that the genus meets the criteria for inclusion in Appendix II, as very few taxa appear to be subject to unsustainable levels of harvest for international trade. It is alleged that some species may be subject to unrecorded trade, but the level or impact of this is unknown. There is evidence that species endemic to Madagascar are in trade and may meet the criteria for inclusion in Appendix II on the basis that harvesting for international trade may be having a detrimental impact on the species (these include *C. albisepta*, *C. armandii*, *C. bosseri*, *C. dimorpha*, *C. hofstaetteri*, *C. leroyi*, *C. racemosa* ssp. *glabra*, *C. razafindratsirana*, *C. saxatilis*, *C. scabra*, *C. simoneae*, *C. stephanotis*, *C. striata* and *C. viridis*). Although many species in the genus may meet biological Criterion A or B for inclusion in Appendix I on the basis of a restricted range and apparently small population size, there is little indication that they meet the trade criterion for inclusion in Appendix I. In cases of uncertainty, Resolution Conf. 9.24 Annex 4A recommends that Parties act in the best interest of the conservation of the species.

	Supporting Statement (SS)	Additional information
Taxonomy	<i>Ceropegia</i> are in the family Asclepiadaceae, and are closely related to the genera <i>Riocreuxia</i> and <i>Brachystelma</i> . In recent years some species named as <i>Ceropegia</i> have been transferred to other genera, and in a few cases <i>vice versa</i> . The very wide distribution of the genus has led to a large number of publications by taxonomists working on floras of limited areas. As a result there is a major problem of dense synonymy. <i>Index Kewensis</i> lists 480 validly published names. The last full revision of the genus was in 1957. Since then a number of new species have been described and in parts of the world, like Tanzania in East Africa, there are a number of undescribed taxa waiting to be named. A safe estimate of the	Asclepiadaceae are considered to part of the Apocynaceae and the latter is now accepted as the family name (Sennblad and Bremer, 1996). Since the monograph of the genus by Huber (1957) there have been a number of regional revisions, the taxonomic conclusions of which are not all reflected in the annex to the SS. A revised annex including all the known taxonomic changes is available. There are 107 changes to the annex including 37 taxa placed into synonymy, seven transferred to other genera, and the addition of 16 new infra-specific taxa and 18 new species. Following these changes, there are 220 species and approximately 49 infra-

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	number of species is around 200. For the taxa of <i>Ceropegia</i> listed in the Annex to the proposal, nomenclature as used by WCMC (Checklist of CITES Species) has been adapted in places to comply with standard nomenclature used in various other works.	<p>specific taxa currently accepted under <i>Ceropegia</i>. The genus is under revision for the <i>Flora of Tropical East Africa</i> and at least eight taxa will be placed into synonymy while six new species will be described (Masinde, 2000).</p> <p>The generic limits of <i>Ceropegia</i> are not well defined as evidenced by the regular transfer of taxa between <i>Brachystelma</i>, <i>Ceropegia</i>, and <i>Riocreuxia</i>. Bruyns (2000) and Rowley (1987) say that <i>Ceropegia</i> and <i>Brachystelma</i> are very closely related and may well be congeneric, as the only feature separating them is a less developed floral tube in <i>Brachystelma</i> (Dyer, 1980, 1983).</p>
Range	Distributed from the Spanish Canary Islands in the west, over central, southern and northern but not Mediterranean- Africa, through Madagascar and Arabia to India and southeastern Asia and northern Australia. <i>Ceropegia</i> occurs in more than 50 countries, including Angola, Australia, Bangladesh, Benin, Bhutan, Burkina Faso, Botswana, Cameroon, Central African Republic, Chad, China, Democratic Republic of the Congo, Eritrea, Ethiopia, Ghana, Guinea-Bissau, Guinea, India, Indonesia, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Malaysia, Mali, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Pakistan, Papua New Guinea, Philippines, Saudi Arabia, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Spain, Sri Lanka, Tanzania, Thailand, China, Togo, Uganda, Yemen, Zambia and Zimbabwe.	<i>Ceropegia</i> is recorded from 58 range States. The following are additions to the list: Comoros, Congo, Djibouti, Lao PDR, Oman, Rwanda, Swaziland and Vietnam. There are no records of <i>Ceropegia</i> in Lesotho (Arnold and De Wet, 1993). Occurrence in Spain refers to the Canary Islands.
IUCN global category	See annex to the proposal.	141 taxa have a threatened status (52%). 136 of these were assessed under the pre-1994 IUCN Red List Categories: Ex 1, Ex/E 1, E 24, V, 4, R 53, I 14 and K 39. Five taxa have been assessed under the 1994 Categories: EN 2 and VU 3.
Biological and trade criteria for retention in Appendix II		
B) Harvesting for international trade has, or may have, detrimental impact on population	<p>More than 98% of trade recorded between 1979 and 1998 is in artificially propagated plants, with significant trade mostly limited to not more than five to ten species. Most recorded trade is not as 'entire live plants', but as rooted stem cuttings. There is no trade at all in most of the species. When tubers are used, in the vast majority of cases this is for local consumption. No illegal trade has been recorded.</p> <p>Growers tend to use vegetative multiplication techniques, thereby ensuring a consistent crop. Generally stem cuttings root well, and most of the international trade is based on that technique. Meristem culture is also increasingly being used, especially in the past five years.</p>	<p>Many <i>Ceropegia</i> species are highly restricted in their distributions and found as scattered individuals or in small groups, and cannot sustain regular collection (Dyer, 1983; Masinde, 2000; Venter, 2000).</p> <p>Jenkins (1993) reported <i>C. woodii</i>, <i>C. armandii</i> and <i>C. volubilis</i> were widely available in the horticultural trade in Europe from artificially propagated stock grown primarily in Europe, North America and to a small extent in South Africa (CITES Annual Report data). These taxa along with some others like <i>C. radicans</i> (Newton and Chan, 1998) appear to fit the description 'super-market plants'. Other species are less commonly seen, but the genus does attract some collector interest. The CITES Annual Report data records only 46 named taxa (17%) in international trade, most</p>
i) exceeds sustainable yield		
ii) reduces population to potentially threatened level		

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		<p>trade is in unnamed specimens. Jenkins (1993) concluded that, as most climbing species are relatively easy to propagate from stem cuttings (Shirley, 1995), wild-collection was unlikely to be a cause for concern.</p> <p>Two cases involving <i>C. insignis</i> and <i>C. stentiae</i> were reported where plants were collected from the wild by nurserymen to serve as stock plants for seed production (Venter, 2000). Seed or seedlings, derived from these mother plants are traded internationally (Venter 2000). Some <i>Ceropegias</i> are difficult to maintain in cultivation and tuberous forms are very susceptible to rot (Rowley, 1987). As a result new stock plants have to be collected from the wild regularly (Shirley, 1995; Venter, 2000). Such cases are few and are largely a domestic rather than international regulation matter.</p> <p>Jenkins (1993) cautioned that caudex-rooted forms from South Africa were sought after and traded as wild-collected plants, an observation supported by the survey done by Newton and Chan (1998). However, from the CITES Annual Report data there is no clear preference for trade in tuberous species over fusiform ones (18 versus 16 taxa). Given the similarity between <i>Ceropegia</i> and <i>Brachystelma</i> and especially that the tubers of species in both genera are indistinguishable (Bruyns 2000, Dyer 1983), there may be undetected illegal trade. Illegal trade in succulents and caudiciforms from South Africa occurs through the postal system and is impossible to monitor or regulate (Newton and Chan 1998).</p> <p>It is unlikely that the discovery of the alkaloid Cerpegin in <i>C. juncea</i> and other tuberous species (Adibatti <i>et al.</i>, 1991) will stimulate a major bio-prospecting exercise. The quantity of tubers required to obtain commercial quantities would be extremely difficult to obtain given the ecology of most species. However, tubers or derivatives may already be in international trade under another name if 'Soma' is widely used in Ayurvedic medicine. Similarly, tubers of <i>Ceropegia tricantha</i>, and possibly other species are used in traditional Chinese medicine (Ping-tao <i>et al.</i>, 1995) and these too may be traded internationally under a different name. There are no reports from India or China about either species being affected by harvesting for the international markets (Nayar and Sastry, 1988; Ping-tao <i>et al.</i>, 1995).</p> <p>Concern about trade in Madagascan species prompted a recommendation in the IUCN/SSC Cactus and Succulent Action Plan that all Madagascan species be transferred to Appendix I (Oldfield, 1997). The recent CITES Annual Report data provide some support for this concern.</p> <p>There is evidence that trade in wild-collected live plants is not always reported (Collenette, 1999; Craven, 1999; Masinde, 2000; Peckover, 1998; Venter, 2000). The extent of this unreported trade is unknown, but it is likely</p>

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		to be small given the low volumes of reported trade in artificially propagated plants, wild-collected plants and illegal exports. In addition, most species are very difficult to find and collect in large quantities as they are inconspicuous, grow in other thorny shrubs and individuals are widely scattered, so any impact will be negligible (Newton and Chan 1998).
A) Trade regulation needed to prevent future inclusion in Appendix I	Trade has no impact.	Illegal trade has been recorded (CITES Annual Report data, 1979-1998; Collenette, 1999; Craven, 1999; Masinde, 2000; Peckover 1998; Venter, 2000), but the extent is unknown, so the impacts of such trade cannot be fully assessed.
Criteria for inclusion in Appendix I		
Trade	Trade is limited to artificially propagated specimens and has no impact on wild populations.	<p>CITES Annual Report data for 1979-1998, indicates 199 records of exports of plants from ten range States. Although the majority of these exports have been of artificially propagated specimens, a small number of exports of wild-collected plants have been recorded from South Africa (seven records), Madagascar (39 records) and Kenya (two records).</p> <p>There were 12 reported cases of illegal trade (86 plants) between 1979 and 1998, five of which involved exports from range States. The largest of these exports was of 40 plants (<i>Ceropegia</i> spp.) from Kenya to Belgium in 1990 and 20 plants (<i>Ceropegia</i> spp.) from South Africa to the Netherlands in 1997. Fifteen exports of wild-collected plants were reported, all of these except for two, were from Madagascar (111 plants). Both Kenyan exports were of wild collected material (46 plants) to a botanical garden in Germany. The Madagascan exports included two for scientific purposes, seven for personal purposes and four cases of commercial trade. Most of the cases involving illegal export or wild-collected plants involved very small numbers of specimens.</p>
Biological criteria		While some taxa have very extensive ranges and some occur in very large numbers, the majority have very fragmented or highly restricted distributions with low population densities (Masinde 2000). Many taxa are found just as a few individuals or are known only from the type collections (Masinde 2000). A number of the small populations are in decline primarily due to habitat loss, harvesting by local communities and in a few instances to over-collection for trade. However, Bruyns (1985) and Peckover (1993, 1998) both report that based on extensive fieldwork, many taxa are more common than indicated by herbarium records and would therefore not meet

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		the criteria for inclusion on Appendix I.
Other information		
Threats	Any disturbance to the habitat is said to result in rapid population declines. In India, habitat destruction and collecting of tubers for local consumption are reported to be the major threats.	<p>Habitat loss (due to agricultural activities, deforestation, afforestation, expanding urbanisation, river flooding, etc.), and plants being grazed by livestock are recorded as key threats (Collenette, 1999; Downs, 2000; Gilbert, 2000; Masinde, 2000; Newton, 2000).</p> <p>On the Canary Islands, some species populations have declined due to collecting for local, private and hotel gardens (Bramwell, 1997).</p> <p>A major threat to the tuberous taxa of <i>Ceropegia</i> in Africa, the Indian Subcontinent and Far East is over-harvesting of tubers and occasionally the fusiform roots (e.g. <i>C. nilotica</i>) for local consumption (Babu, <i>et al.</i> 1997; Dyer, 1983; Hargreaves, 1990; Peters, <i>et al.</i> 1992; Ping-tao, <i>et al.</i> 1995). The tubers are also used for medicinal purposes e.g. <i>C. stanantha</i> is used to treat stomach ache (Kokwaro, 1976) and as a lucky charm (Gelfand, <i>et al.</i> 1985). <i>Ceropegia juncea</i> is reported to be the source of 'Soma', a plant drug of the Ayurvedic system of medicine with a wide variety of uses (see Adibatti <i>et al.</i>, 1991). Adibatti <i>et al.</i> (1991) have isolated a new pyridine alkaloid (Cerpegin) from <i>C. juncea</i> which shows a number of promising pharmacological properties and no negative side-effects. They reported promising tranquillising, hypotensive and local anaesthetic activities. The alkaloid Cerpegin is probably present in all tuberous species, which may explain the intense use of tubers across the entire distribution range. <i>Ceropegia tricantha</i> tubers are also reportedly used in Chinese medicine (Ping-tao <i>et al.</i>, 1995).</p>
Conservation, management and legislation	As a national protection measure in India all <i>Ceropegia</i> species are included in the negative list of export and import.	All species of <i>Ceropegia</i> are protected by the provincial nature conservation ordinances in South Africa and are also declared protected in Namibia and Swaziland (see Hilton-Taylor, 1997). However, enforcement is problematic (Hilton-Taylor, 1997; Newton and Chan, 1998). There is no additional legislation to protect <i>Ceropegia</i> in any East African country (Masinde, 2000).
Similar species	The retention of <i>Ceropegia</i> spp. in Appendix II would not enhance control of other listed species.	<i>Ceropegia</i> tubers are not readily distinguishable from those of <i>Brachystelma</i> (Bruyns, 2000; Dyer, 1983). Although <i>Brachystelma</i> is not currently included in the Appendices, there is concern over trade levels in this genus (Newton and Chan, 1998). It may be that some <i>Ceropegia</i> species are being traded under the name <i>Brachystelma</i> to circumvent CITES regulations. At least 62 <i>Ceropegia</i> taxa have discoid tubers identical to those of <i>Brachystelma</i> , while a further 46 taxa have tubers of various forms. Of the remaining taxa, 43 have unknown rootstocks, 21 have fibrous roots and 97 have fusiform roots.

Reviewers: P. Bruyns, P. Craven, P. Downs, M. Gilbert, P. Masinde, L. Newton, S. Oldfield, D. Plowes, TRAFFIC East/Southern Africa - South Africa, E. van Jararsveld, F. Venter

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