

Monitoring internet trade to inform species conservation actions

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Supplement

Text S1: Survey results relating to records of seeds being offered for sale.

Although our expert could not classify the sales offers for seeds as wild collected or propagated, it is possible to make a tentative assessment based on typical reproductive biology of each genus. *Uncarina* species are relatively easy to hand pollinate, making the cultivation of seeds relatively easy once adult plants have been obtained. *Cyphostemma* species have relatively simple flower structures implying generalist pollination and therefore, the production of seed is likely to be relatively easy once mature plants have been obtained. Thus the problem of producing seeds for *Uncarina* and *Cyphostemma* appears to mainly be obtaining reproductive adult plants. *Adenia* includes monoecious and dioecious species and can typically be pollinated by a variety of species in the wild (e.g. sunbirds and bees). Their floral structure is complex and so hand pollination would require skill but would probably be possible, and the resulting fruits contain many seeds. Thus it seems likely that moderately skilled growers could produce *Adenia* seeds. Species of the genera *Commiphora* and *Operculicarya* are dioecious, implying that both male and female plants must be cultivated. The species are also trees, requiring significant physical space, light and resources to cultivate mature flowering individuals. Hand pollination will probably also be necessary to successfully pollinate these plants. Thus it seems likely that the seeds of *Commiphora* and *Operculicarya* have been collected from the wild. The 336 sales offers of seeds we recorded, represent all genera in our survey, CITES-listed and non CITES-listed species, 12 different countries and 20 different suppliers (Fig. S1 details the number of records by species). It therefore seems inevitable that seeds of at least some of the species are also collected from the wild to support international trade. This might not pose any threat to the wild populations of those species, and seeds of Appendix II species are typically exempt from CITES regulations (the exception being those of certain cacti from Mexico) but is additional circumstantial evidence that wild populations of these species, many of high conservation concern, are being harvested to support international trade.

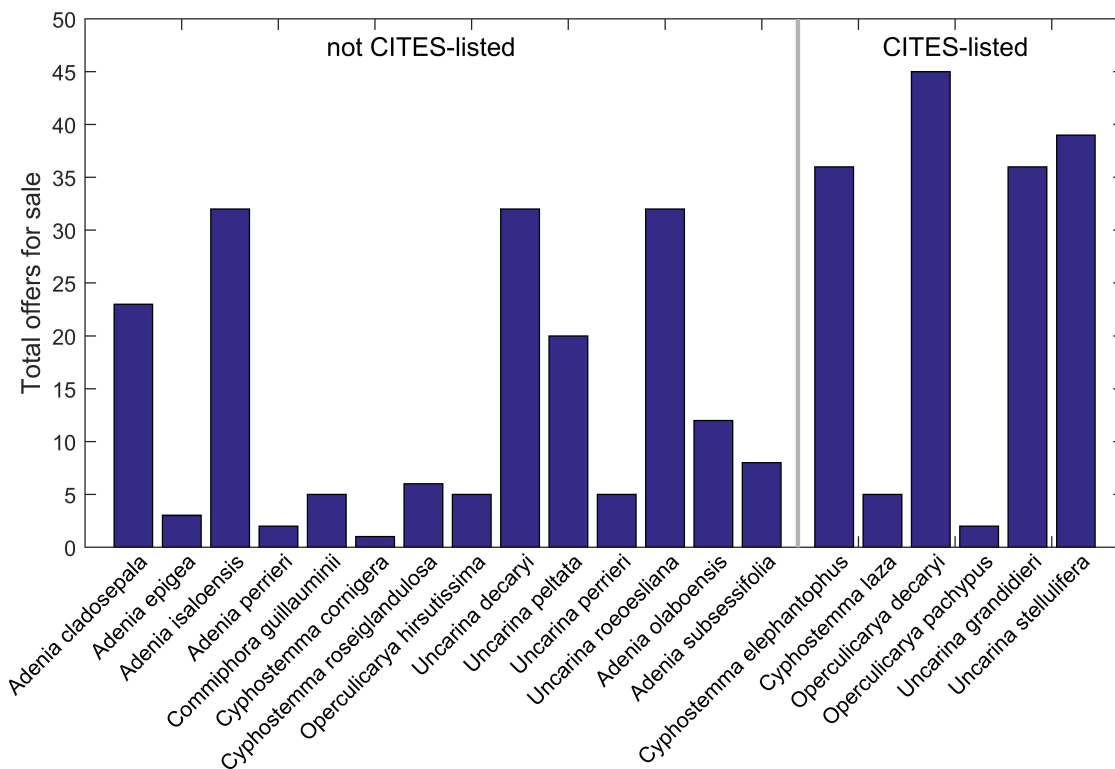


Fig. S1: Illustrates the number of records of seeds being offered for sale in our 2013 survey by species

Table S1: Summarises the genera included in our internet survey.

Genus	Reason for inclusion in survey	Species in survey	CITES-listed species in survey	Records in survey	Records in survey of CITES-listed
<i>Adenia</i>	Understood to be sought after by collectors. Wild collected specimens had been observed in international trade selling for high prices (over \$200) and were observed in nurseries outside Madagascar. All species from Madagascar were thought to potentially to be involved in trade.	9	3	118	43
<i>Commiphora</i>	Entered trade only recently. Wild collected specimens had been observed in trade, including nurseries outside Madagascar.	6	0	27	0
<i>Cyphostemma</i>	Has a long cultivation history with <i>C. juttae</i> cultivated worldwide because of easy and fast propagation. Propagation is slower for other species is slower making wild collection a potentially more attractive alternative.	5	3	144	116
<i>Operculicarya</i>	Wild specimens of unlisted species have been recently observed in trade.	5	3	173	163
<i>Uncarina</i>	Wild specimens of unlisted species have been recently observed in trade.	10	2	286	91

Table S2: Summarises the history of CITES-listing for the species covered by our survey and when the species appeared in our historical nursery catalogues.

Species	Year listed on CITES App. II	In trade at least since year
<i>Adenia firingalavensis</i>	2013	1994
<i>Adenia olaboensis</i>	2010	1994
<i>Adenia subsessifolia</i>	2013	unknown
<i>Cyphostemma elephantopus</i>	2010	1994
<i>Cyphostemma laza</i>	2013	1994
<i>Cyphostemma montagnacii</i>	2010	unknown
<i>Operculicarya decaryi</i>	2013	1989
<i>Operculicarya hyphaenoides</i>	2010	unknown
<i>Operculicarya pachypus</i>	2010	unknown
<i>Uncarina grandidieri</i>	2013	unknown
<i>Uncarina stellulifera</i>	2013	1994

Table S3: Details the questions posed to our experts prior to the internet surveys and during the internet surveys.

Question – prior to the internet surveys	Possible answers
Conservation concern: how threatened are the wild populations with extinction?	low, medium, high, unknown
Conservation priority: what is the level of urgency to undertake action to conserve the species in the wild?	low, medium, high, unknown
Cultivation status: what is the likelihood of a plant in trade being that of a wild collected specimen?	low, medium, high, unknown
Ease of propagation: how easy is it to propagate the species?	easy, medium, hard, unknown
Question – during the surveys	
Do you think the specimens in the photograph are wild, propagated or unknown?	wild collected, propagated, unknown

Table S4: Break down of the number of records in our survey by country.

	Country	No. recorded sales offers
Internet auction sites	Australia	5
	Cyprus (Greek side)	8
	Czech Republic	2
	Germany	4
	France	2
	Hungary	3
	India	2
	Netherlands	2
	Thailand	2
	United Kingdom	22
	United States of America	88
South Africa	7	
Nurseries	Czech Republic	78
	Germany	137
	Spain	31
	France	68
	Italy	7
	Netherlands	108
	United Kingdom	17
United States of America	155	