Inclusion of *Operculicarya decaryi* in Appendix II

Proponent: Madagascar

Summary: *Operculicarya decaryi* sometimes known as jabihy is a deciduous thick-stemmed (pachycaul) tree endemic to Madagascar which can grow up to nine metres tall. It is one of eight species in the genus *Operculicarya*, seven of which are endemic to Madagascar, with the eighth (*O. gummifera*) occurring in Madagascar and the Comoros. It is widespread in thorny scrub and degraded semi-deciduous forest at low altitude in southern Madagascar, within an overall area of some 90 000 km^2 and an area of occupancy of at least 3000 km^2, with at least 30 subpopulations within this area. The species can be locally abundant, with an estimate of over 30 000 individuals within one sub-population. The species is present in at least three protected areas (Cap Sainte Marie Special Reserve and Andohahela and Tsimananpetsotsa National Parks).*O. decaryi* is cultivated as an ornamental plant due to its bonsai form, particularly in China. Wild collection has reportedly taken place. Exports from Madagascar, apparently mostly of small plants is recorded as having taken place. Some 3400 plants were recorded by the CITES Management Authority of Madagascar as exported in the period 2003-2006, most (around 2700) in 2006. Exports have not been reported since then. The species is reported to be straightforward to propagate. In China recent trade is said to be largely or entirely in cultivated plants. The species has reportedly been in cultivation in China for some time, so that large, mature plants may be available from artificially propagated material. Current legal controls in Madagascar on collection and export are unclear.

O. decaryi was proposed for inclusion in Appendix II at CoP15 in 2010, but the proposal was withdrawn at the CoP. Two species of *Operculicarya* also endemic to Madagascar (*O. hyphaenoides* and *O. pachypus*) were included in Appendix II at CoP15. Since then importers have reported a small amount of trade in *O pachypus* (50 wild specimens in 2010 and 50 in 2011) but none in *O. hyphaenoides*. Madagascar has reported export of 350 *O. pachypus* and 275 *O. hyphaenoides*, but these are likely to have been on the basis of permits issued rather than actual exported recorded.

Analysis: *Operculicarya decaryi* is a widespread and evidently at least locally abundant tree in southern Madagascar. It has been exported in some number for the horticultural plant trade in the relatively recent past. No exports have been reported since 2006. The species is widely available as an artificially propagated plant. It is extremely unlikely that regulation of trade is necessary to prevent the species becoming eligible for inclusion in Appendix I in the near future, or that harvest for trade is reducing the population to a level at which its survival might be threatened by other influences. The species would therefore not appear to meet the criteria for inclusion in Appendix II.

Supporting Statement (SS)	Additional information
Range	
Madagascar.	
IUCN Global Category	
	Not currently listed.

Supporting Statement (SS)	Additional information
Biological and trade criteria for inclusion in Appendix II (Res. Conf. 9.24 (Rev. CoP15) Annex 2 a)	
A) Trade regulation needed to prevent future inclusion in Appendix I	
The species has low growth rates and a regeneration rate of 24%.	
Around 150 individuals were recorded in the North of Toliara (Andoharano Forest) in 2005. 440 individuals were recorded in Tongobory in 2006. At the start of January 2012, 79 individuals were recounted at Andatabo Toliara, an area of known wild collection. In this area, *O. decaryi* is becoming increasingly rare.	*Rakouth* et al. *(2006) reported densities of 220-400 per ha at study sites with one sub-population calculated to comprise over 30 000 individuals.*
The status according to IUCN criteria is reported to have changed from vulnerable to endangered. This means a reduction of ≥ 50% in 10 years of Area of Occupancy, Extent of Occurrence and habitat quality.	*The conservation status is not published on the IUCN Red List. The Endangered assessment in the proposal was assigned using GIS data, which were used to calculate Area of Occupancy and Extent of Occurrence and to predict future decline (PC20 Inf. 4, 2012). No date is provided for the first of these assessments.*
Collection for export and destruction of habitat leads to a gradual decline in the population, which is predicted in the future to decline by 77%. Collectors are forced to go further because the old collection areas near cities no longer have individuals present.	*The future decline predicted in the proposal is over an unspecified time period. The evidence upon which the decline is predicted is not detailed in the proposal.*
Operculicarya decaryi is the most widespread species of the five species in the *Operculicarya* genus.	*Randrianasolo and Lowry (2006) report that* O. decaryi *is more widespread than other members of the genus, except* O. gummifera*. It is reported to extend throughout much of southern Madagascar, from Toliara east to Ambovombe.* *Hearn* in litt. *(2012) considers the range of* O. decaryi *to be restricted. He notes the desirability of field-collected specimens and reports that collection is widespread*
O. decaryi has a large geographic distribution in the dry thorny thicket of South Western and Southern Madagascar. The Area of Occupancy is 423 km^2 and the Extent of Occurrence is 86 994.7 km^2.	*Randrianasolo and Lowry (2006) assign* O. decaryi *a preliminary status of Least Concern (LC) and report that* O. decaryi *has an Extent of Occurrence slightly lower than provided in the proposal (c. 71 600 km^2) but an Area of Occupancy much larger than that reported in the proposal (3000 km^2). Around 30 subpopulations are reported.*
The species continues to decline due to various threats and pressures. The dry thorny thicket of the South West occupies an area of 18 355 km^2 (of which 5% is found within protected areas). This type of land cover has reduced by 30% since the 1970s. These areas are fragile and easily fragmented and degradation has resulted in open degraded areas.	
B) Regulation of trade required to ensure that harvest from the wild is not reducing population to level where survival might be threatened by continued harvest or other influences	
O. decaryi is very sought after as an ornamental plant for its bonsai form. The species is often collected in the wild and an absence of individuals of a juvenile or	O. decaryi *is a natural bonsai and grows a thick fat stem quickly. The knobbly trunk is sought after by collectors. The roots swell to form unique contorted and twisted*

Supporting Statement (SS)	Additional information
adult state, of commercially exploitable size, can be observed at collection areas.	*designs and the leaves are also very small, ideal for the bonsai form (Anon, B).*
	Yuan in litt. *(2012) reports that* O. decaryi *is very commonly traded in China. Trade is primarily of mature plants and sometimes seedlings. The species has been traded in China for a long time, early trade was likely from wild plants and more recent trade is of cultivated material. Wang and Chen* in litt. *(2012) also report the presence of* O. decaryi *in trade in China.*
It is exported as a living plant. Reported exports of living plants are as follows: 2003 (56), 2004 (200), 2005 (495) and 2006 (2647).	*Exports are in the form of small plants (supporting statement of proposal CoP15 Prop. 22).*
Collectors tend to take many plants. Exportation could lead to the absence of natural regeneration and the decline or even disappearance of populations in areas of collection which in the long term would constitute a serious threat to the species.	*No trade was reported subsequent to 2006.*
No illegal trade in the species has been recorded to date. The species is rarely sold in national markets.	*Two species of* Operculicarya *also endemic to Madagascar (*O. hyphaenoides *and* O. pachypus*) were included in Appendix II at CoP15. Since then importers have reported a small amount of trade in* O pachypus *(50 wild specimens in 2010 and 50 in 2011) but none in* O. hyphaenoides*. Madagascar has reported export of 350* O. pachypus *and 275* O. hyphaenoides, *but this is likely to have been on the basis of permits issued rather than actual export recorded.*
The proposal reports 18 web sources of *O. decaryi*, selling mature plants, seedlings or seeds, mainly of unknown origin (one source sold propagated material). Price per plant ranged from USD14.95 – 400.00 and per seed USD0.39 – 0.86.	*A nine-day web survey to investigate web trade for* O. decaryi *was conducted in 2011 (Augugliaro* in litt., *2012). Thirty-eight plants and twenty-seven packages of seeds of* O. decaryi *were found sold from the UK, USA, Germany, and Hungary. For nineteen sources it was possible to track both seller and buyer countries. Between the sales 84% were realized inside in the seller's country and 16% were realized in a foreign country. Furthermore, another forty-one plants and twenty-four packages of seeds were offered from Asia, the EU, and USA. Data from the web survey showed that some specimens of* O. decaryi *offered on the web are probably of wild origin (Augugliaro* in litt., *2012). The price of one specimen was USD1200 (Augugliaro* in litt., *2012).*
	Plants of O. decaryi *are currently offered for sale on various websites in the UK, USA and China. Although large specimens are sold for high prices there is also trade in seedlings for lower prices. Six websites were identified selling small plants for less than USD25.00, with the lowest price per individual at USD7.00. A web seller based in China was identified to have sold 21 mature plants for USD100.00 since November 2011.*
	A two day review of web sellers based in Japan selling O. decaryi *was conducted (04-05 December 2012). Two websites selling* O. decaryi *plants were identified (although these directed to the same source) and one website selling seeds was identified (TRAFFIC Japan, 2012).*

Supporting Statement (SS)	Additional information
Inclusion in Appendix II to improve control of other listed species	
A) Specimens in trade resemble those of species listed in Appendix II under Res. Conf. 9.24 (Rev. CoP15) Annex 2 a or listed in Appendix I	
O. decaryi slightly resembles *O. pachypus.* This second species has a limited distribution around Toliara and is found on limestone. The branches of the two species are zigzag, but those of *O. pachypus* have tips in the form of sharp spines.	O. decaryi *is often confused with* O. pahypus*, but "in addition to its distinctive habit, several additional features separate* O. decaryi *from other members of the genus whose leaves have a winged rachis, including leaflets that are totally glabrous below, and branches that are straight (rather than zig-zag in orientation, as in* O. pachypus*)" (Randrianasolo and Lowry, 2006).* O. hyphaenoides *and* O. pachypus *were included in Appendix II in 2010. Since then importers have reported a small amount of trade in* O. pachypus *(50 wild specimens in 2010 and 50 in 2011) but none in* O. hyphaenoides*. Madagascar has reported export of 350* O. pachypus *and 275* O. hyphaenoides*, but these are likely to have been on the basis of permits issued rather than actual export recorded. The other five species of* Operculicarya *(four endemic to Madagascar, one also on the Comoros) are not included in the Appendices.*
Other information	
Threats	
Habitat destruction: small but widespread operations for the production of fuel wood and charcoal are the biggest threats to the habitat. Selective logging for timber is also a significant threat, especially because the dry thorny thicket has a low growth and regeneration rate. The extension of land for maize cultivation and fires linked to grazing animals also constitute serious threats in the region. In Andatabo the species grows on calcareous soils that are currently used for making bricks.	
Conservation, management and legislation	
Collection and export are only regulated at a national level. Para 7.1 of the SS states: collection and export [of this species] are not subject to any controls. Para 8.1 of the SS states: National management measures are detailed in the proposal: The number of specimens authorised for export is based on the supply of the species in horticultural centres. A single harvest authorization per species per operator is provided, to serve as parental stock. Operators should undertake ex situ reproduction. Permits and exportation authorizations are supplied only for individuals reproduced artificially.	*The level of national legislation afforded to this species is unclear as the proposal notes that harvest and export are not subject to regulation and later that they are subject to national authorization procedures. Information as to whether national management measures have been enforced or how successfully is not provided. Expert reviewers were asked to provide additional information about national legislation and its effectiveness but none of the comments received clarified this.*

Supporting Statement (SS)	Additional information
Certain populations of *O. decaryi* are found within protected areas; Andohahela National Park, Tsimanapetsotsa National Park and la Réserve Spéciale de Cap Sainte Marie. The State policy to increase the coverage of protected areas and delineate new areas such as Amoron'i Mania, Ekodida, could contribute to the conservation of this species and its habitat.	*Randrianasolo and Lowry (2006) report presence of the plant in Andohahela, but also in Beza Mahafaly protected areas.* *According to PlantSearch, an online database of botanic garden collections maintained by Botanic Gardens Conservation International (BGCI), 36 gardens record holding* O.decaryi *in their collection. The majority of these gardens are within Europe and the USA.* *In addition,* O. decaryi *is also held in the collection of Phyto-logic Paradise Gardens in Madagascar. The original specimen has been in the garden for more than 10 years. The garden are attempting multiplication through cuttings without success yet but attempts only commenced a couple of months prior to this consultation (undertaken in November 2012) (Cooke* in litt., *2012). Parc Botanique et Zoologique de Tsimbazaza in Madagascar holds one individual of* O. decaryi *in their collection. The plant was collected as a wild seedling and the species is not involved in a propagation programme.*
	Captive Breeding/Artificial Propagation
	Bihrmann in litt. *(2012) reports that* O. decaryi *is a rather slow growing species. Small seedlings do form the caudex, although it is rather slim.* Operculicarya *species have been praised by growers, collectors and exhibitors for decades and are highly desirable because of their ease in cultivation. Eslamieh and Stead (2010) experimented with various crosses with other* Operculicarya *species* *Reproduction is possible from seed and cuttings. It can be propagated using pieces of the tuberous roots (Anon A, undated.) Seed grown plants produce better looking roots, growing from seed offers the possibility of selective breeding and can produce certain desired characteristics (Anon, B). Hearn* in litt. *(2012) reports that in his experience the rooted cuttings and other forms of vegetative propagation are less desirable than seedlings or field collected plants as the formation of the caudex is hampered under vegetative propagation.* *The species is dioecious (as all other of the genus) so at least two plants (male and female) are necessary to obtain seeds in cultivation. Propagation from cuttings is fairly straightforward (Eggli* in litt., *2012).*
	Other comments
This species was already the subject of a trade study with the aim of its inclusion in Appendix II at CoP15. Biological and ecological data obtained were updated and supplemented for the preparation of this new proposal. Under an agreement between the CITES Secretariat and the European Union, *O. decaryi* will continue to be the object of research for the year 2012 to supplement existing data.	*Chemicals within the plant are toxic (Colombo* et al., *2009).* O. decaryi *is fed on by* Lemur catta *(Jolly* et al., *2006).*

Supporting Statement (SS)	Additional information
This species has an important role in the daily life of the local population as it is used in traditional medicine. The leaves have medicinal value and are used to help the recovery of women after giving birth.	

Reviewers: C. Augugliaro, A. Cattabriga, U. Eggli, D. Hearn, D. Newton.

References:

Anon A. (undated). Operculicarya decaryi. Available at: http://toptropicals.com/catalog/uid/Operculicarya_decaryi.htm Viewed on 25 October 2012

Anon B. (undated). Operculicarya decaryi. Available at: http://www.botanicwonders.com/Feature-Operculicarya-decaryi.html Viewed on 27 November 2012

Augugliaro, C. (2012). In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.

Bihrmann, E. (2012). In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.

Cooke, B. (2012). In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.

Colombo, M.L., Assisi, F., Della Puppa, T., Moro, P., Sesana, F.M., Bissoli, M., Borghini, R., Perego, S., Galasso, G., Banfu, E. and Davanzo, F. (2009). Exposures and Intoxications after herb-induced poisoning: A retrospective hospital-based study. *Journal of Pharmaceutical Sciences and Research*. Vol. 2(2):123-136 Available at: http://www.jpsr.pharmainfo.in/Documents/Volumes/Vol2Issue2/jpsr02021009.pdf Viewed on 01 November 2012

Eggli, U. (2012). In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.

Eslamieh, J. and Stead, J. (2010). The Heterosis of Operculicarya. *Cactus and Succulent Journal* Vol 82 Number 6 http://www.jason-eslamieh.com/Heterosis-of-Operculicarya-Eslamieh.pdf

Hearn, D (2012). In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.

Jolly, A., Sussman, R.W., Koyoma, N. and Rasamimanana, H. (2006). Ringtailed Lemur Biology: Lemur catta in Madagascar. *Developments in Primatology: Progress and Prospects*.

PC20 Inf. 4 (2012). Examen des propositions d'amendement des annexes I et II : Cas de trois espèces succulentes : *Adenia subsessifolia, Operculicarya decaryi* et *Senna meridionalis*. Information presented at the twentieth meeting of the Plants Committee. Available at : http://www.cites.org/common/com/PC/20/Inf%20docs/F20-04i.pdf Viewed on 25 October 2012

PlantSearch. (2012). http://www.bgci.org/plant_search.php Viewed on 01 November 2012

Rakouth, B., Ravaomanalina. H. and Rakotonavalona, A. (2006). Etude biogéographique et bioécologique de quelques espèces menacées dans le Sud de Madagascar dans le cadre de la CITES pour l'année 2005. Rapport final. Conservation International Madagascar.

Randrianasolo, A. and Lowry, P. (2006). Operculicarya (Anacardiaceae) revisited: an updated taxonomic treatment for Madagascar and the Comoro Islands, with descriptions of two new species. *Adansonia* series 3: 28 (2)

TRAFFIC Japan. (2012). Very brief overview of trade in Madagascan succulent species in Japan. In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.

Wang, C.C. and Chen, H.B. *(2012).* In litt. to the IUCN TRAFFIC Analyses Team, Cambridge, UK.

Yuan, W. (2012). In litt. to the IUCN/TRAFFIC Analyses Team, Cambridge, UK.