Inclusion of *Adenia firingalavensis* in Appendix II

Proponent: Madagascar

Summary: *Adenia firingala*vensis is a climbing succulent shrub with a caudiciform (swollen) stem and roots. It is one of 100 or so members of *Adenia*, a genus widespread in Madagascar and Africa. It is endemic to Madagascar where it is reportedly widespread and common, occurring from the north of the island to the south, chiefly in the west but with populations also recently discovered in the eastern part of the country. The species is used locally in Madagascar in traditional medicine. The bark is used to treat scabies. Its habitat is affected by a number of factors, including agricultural expansion, bushfires and charcoal production. The species has appeared in the live-plant trade and is available to buy in Asia, Europe and the USA. Seeds and small plants are available to purchase from various sources, as well as mature individuals with a developed caudex stem. Propagation from seed is reported to be easy but slow, and propagation from cuttings possible but rather difficult. Demand generally appears to be relatively low. Some trade from Madagascar has been reported - just over 450 exported in the period 2003-2006, the great majority (358 in 2004). It is likely that most if not all of these were wild-collected. No export trade has been reported since 2006. Current legal controls in Madagascar on collection and export are unclear.

The species was proposed for inclusion in Appendix II at CoP15 but the proposal was withdrawn at the meeting. At CoP15 one Malagasy *Adenia* species (*Adenia olaboensis*) was included in Appendix II; no trade in it has been recorded under CITES since the listing.

Analysis: *Adenia firingalavensis* appears to be a widespread and common plant in Madagascar. There has been some collection from the wild for export as live plants which may have led to localised depletion at collection sites, but no export has been reported since 2006 and the species is not reportedly in wide demand. 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
Taxonomy	
Synonyms: *Ophiocaulon firingalavense.*	
Range	
Madagascar.	
IUCN Global Category	
	Not currently listed.
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 a wide distribution and is found in all deciduous forests of Western, South western and Southern Madagascar. It is partly found within the	*Petignat and Cooke (2009) report that* Adenia firingalavensis *is common in the North and West of Madagascar. Rauh (1998) reports that the species is distributed from*

Supporting Statement (SS)	Additional information
protected areas of la Réserve Spéciale d'Ankarana, Bemaraha National Park, Ankarafantsika National Park and the Mikea forests les Réserves Spéciales de Kirindy and Andranomena.	*Sambirano in the north to Morondava-Manja in the south. These distributions align with the map presented in the proposal.* *The Plant Resources of Tropical Africa (PROTA) website reports that* Adenia firingalavensis *is generally common.*
The species is found in two main types of habitat; dry thorny thicket and dry forest. The dry thorny thicket of the South and South West of the island covers an area of approximately 18 355 km^2, (4.5% is located within protected areas) and has reduced by 29.7% since the 1970s. The dry forest of the West of the island covers an area of 31 970 km^2 (of which 17% is within protected areas). This type of forest reduced by 39.7% since the 1970s.	*Hearn* in litt. *(2012) notes that* A. firingalavensis *is widespread and common; many new populations of* A. firingalavensis *were found in eastern Madagascar between Antalaha and Daraina during surveys in the early 2000's and 2010. Hearn also notes distribution in the South of the island. Hearn* in litt. *(2012) comments that* A. firingalavensis *is a very variable species, some of these distinct forms from the south are likely to be more threatened than the Eastern elongate forms.*
The species is reported to have been assessed as vulnerable using the IUCN criteria.	*The species is not currently listed on the IUCN Red List. The IUCN status (Vulnerable) given 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. 5, 2012).*
The Area of Occupancy of *A. firingalavensis* is estimated to be 99 km^2 and the Extent of Occurrence is estimated to be 91 994 km^2. The area occupied by the species continues to decrease each year due to fires and deforestation caused by the expansion of agricultural lands. The distribution is fragmented.	*It is not clear what the basis for the estimation of area of occupancy is, given the extremely widespread distribution; it is like to be a considerable underestimate. Hearn* in litt. *(2012) notes that the area occupied by the species is likely to be greater than the reported estimate of 99 km^2.*
The species has a fairly low density, between 60 and 70 individuals per hectare. Regeneration potential is low; 18.2% at Beroboka and 150% at Andranomena. A future population decline of 70% is predicted due to wild collection and habitat destruction.	*The proposal notes a future decline of 70%. It does not mention over what time frame this decline is expected.*
The species is collected from the wild and, in collection areas, individuals of a commercially exploitable size are reported as becoming increasingly rare.	
Harvesting could lead to the absence of natural regeneration and the decline or even disappearance of populations in certain areas of collection. In the long term this would pose a serious threat to the survival of the species. As the geographic distribution of the species is fragmented, collectors change areas of collection as one area becomes exhausted.	
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	
The species is a sought after ornamental plant on the international market. It is exported as a living plant.	*The species is reported to be very easy to see in the north of Mahajanga (18 km from the town) and collection of mature individuals for sale to the international market is reported from this locality. The number of plants has been observed to be decreasing due to wild collection (Rakotonasolo* in litt., *2012).*
Reported exports of living plants are as follows: 2003 (18), 2004 (358), 2005 (68),	

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2006 (10), 2007 (0) and 2008 (0). No illegal trade in the species has been recorded to date. The species is rarely traded in local markets.	*Hearn* in litt. *(2012) notes that* A. firingalavensis *is collected by hobbyists, but he has not seen the plant sold in other contexts.* *Reports of trade in the species are rather conflicting. Cattabriga* in litt. *(2012) reports that the species is often available on European markets in the form of small specimens of wild origin. Eggli* in litt. *(2012) reports that there is no substantial market for large ex-habitat specimen plants and that the hobby community interested in the warmth-loving Madagascan succulents is not very large. He also notes that the demand from public gardens should be negligible due to CBD/ABS regulations.* *The Plant Resources of Tropical Africa (PROTA) website reports that the species is traded internationally as an ornamental, but on a small scale only*. *PROTA reports that the species is likely to remain of marginal economic importance* (Oyen, 2010). *Dotort (2007) reports that the genus Adenia are 'not easy to find for sale, but a few succulent garden nurseries are currently propagating them'.* *Yuan* in litt. *(2012) reports that* A. firingalavensis *is common in China, with trade being mainly of seeds and small seedlings. However, Wang and Chen (2012) report that although the species is available for sale in China, sales are limited.* *Rakotonasolo* in litt. *(2012) reports that seedlings of* A. firingalavensis *are slender and not considered attractive, so collector interest is limited to mature individuals. However, the presence of seeds and seedlings in trade indicates that there is also interest in small plants. This is confirmed by Hearn* in litt. *(2012) who reports that smaller seedlings are still quite desirable in the succulent trade.*
The proposal reports three web sources selling mature *A. firingalavensis* plants or seeds. The majority are of unknown origin. One source sold propagated material. Prices per plant ranged from USD75.00 – 236.72 and per seed USD1.41.	*A web review confirms the availability of* A. firingalavensis *to purchase from online sources. Seed, small plants and larger individuals with developed caudex stems were offered.* • *An individual with developed caudex base was offered for USD38 from a seller in the USA. The origin of the plant is unknown.* • *Individuals with small base (1/2 - 3/4inch) were available for USD12 from a seller in the USA. The origin of the plant is unknown.* • *Individuals are offered at a price of USD4.80 from a seller in China. The origin and size of the plants is unknown.* *A nine-day web survey to investigate web trade for* A. firingalavensis *was conducted in 2011 that identified seven plants and two packages of seeds offered from Germany, the Netherlands and the USA, with prices ranging from USD5 to 75*

Supporting Statement (SS)	Additional information
	(Augugliaro in litt., *2012).*
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	
	The species is highly variable and bears some resemblance to a number of other Malagasy Adenia *species, only one of which,* A. olaboensis, *is included in Appendix II. The latter species was included in Appendix II in 2010. No trade in this has been reported since then.*
Other information	
Threats	
In addition to collection from the wild, habitat destruction by various anthropogenic activities results in a gradual decline of the number of existing populations.	*Collection for traditional purposes appears to be limited. A poor quality fibre can be produced from the stem. The wax covering the stem is also collected. The plant is very toxic so its use as a medicinal plant is limited to experienced traditional healers (Oyen, 2010)*.
Forests are disappearing rapidly and are becoming fragmented due to charcoal production from wood, agricultural expansion for maize production and bushfires to create new pasture for livestock.	*The population at Mahajanga is reported to be being destroyed due to charcoal production (Rakotonasolo* in litt., *2012).*
Conservation, management and legislation	
Collection and export are 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.*
Part of the habitat of *A. firingalavensis* is located within protected areas (Ankarana, Bemaraha, Kirindy, Andranomena, Kirindy Mitea, and Tsimanapetsotsa). The recently delineated new protected areas could broaden the conservation areas for this species, such as Corridor Bongolava, Amoron'ny Onilahy and Ekodida. A trade study was carried out previously for *A. firingalavensis* with the aim of its	Adenia firingalavensis *is also reported in Tsingy de Namoroka protected area (Anon, undated).* *According to the online database of Botanic Gardens Conservation International (BGCI), PlantSearch, 13 gardens record holding* A. firingalavensis *in their collection. None of these gardens are within Madagascar, potentially limiting their involvement in*

Supporting Statement (SS)	Additional information
integration in Appendix II of CITES in 2010. The proposal suggests that to ensure the sustainability of the species, licenses and export permits must be limited to artificially propagated specimens.	*restoration activities.* *The species is not held in the collection of Phyto-logic Paradise Gardens in Madagascar (Cooke* in litt., *2012). The Parc Botanique et Zoologique de Tsimbazaza (PBZT) in Madagascar holds five mature individuals of* A. firingalavensis *which are around 25 years old. No propagation from seeds has been undertaken (Rakotonasolo* in litt., *2012).*
Captive Breeding/Artificial Propagation	
Propagation from seed is easy but slow. Propagation from cuttings is possible.	*Bihrmann* in litt. *(2012) reports that* A. firingalavensis *is a slow growing species. Small seedlings do form the caudex. Propagation from cuttings is also possible, but rather difficult. Hearn* in litt. *(2012) notes that rooted stem cuttings are not as desirable as seedlings and field collected plants.* *No propagation of* A. firingalavensis *has been observed in Madagascan nurseries (Rakotonasolo* in litt., *2012). It is therefore assumed that all exports are wild collected specimens.*
Other comments	
A. firingalavensis was proposed for inclusion in Annex II at CoP15 in 2010. 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 Scientific Authority Flore-Madagascar, *A. firingalavensis* is the subject of research in the year 2012 to supplement existing data.	*Several other Malagasy* Adenia *species such as* A. epigea, A. litoralis, A. stylosa, A. boivinii, A. lapiazicola, *and* A. metamorpha *resemble* A. firingalavenis*. Some of these are rare and have been exported.* *Hearn* in litt. *(2012) notes that the species' appearance varies a lot across its range, from small succulent plants to elongated forms.* *Eggli* in litt. *(2012) reports that differentiating between the various taxa is difficult, and that this is especially true when plants are shipped as pruned individuals, and without leaves or other growth. Hearn (2007) suggests using molecular and morphological data, that the form* A. firingalavensis var. stylosa*, is a separate species,* A. stylosa.

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

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