

AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

Other Proposals

A. PROPOSAL

Inclusion of *Khaya* spp. in Appendix II.

B. PROPONENT

The Federal Republic of Germany.

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Dicotyledoneae
12. Order: Sapindales
13. Family: Meliaceae
14. Genus: *Khaya* A. Juss

The taxonomy of *Khaya* remains somewhat unclear and the following information should be treated as provisional. Pennington and Styles (1975) recognize approximately 7 species, 5 in tropical Africa and 2 in Madagascar and the Comores. More recently Styles and White (1991) have recognized just 6 species:

K. anthotheca (Welw.) C.DC.
K. grandifoliola C.DC.
K. ivorensis A.Chev.
K. madagascariensis Jum. & Perr.
K. nyasica Stapf (sometimes regarded as *K. anthotheca*)
K. senegalensis (Desr.) A. Juss.

15. Common Names/
Trade Names:

Besides the generic trade names African Mahogany and Khaya, trade names of specific taxa are usually associated with country or port of origin:

K. anthotheca - Ghana/Côte d'Ivoire/Takoradi/Khaya or Grand-Massam Mahogany, Krala (Côte d'Ivoire), Mangona (Cameroon), White Mahogany, Smooth-barked Mahogany, Acajou d'Afrique, Acajou blanc;

K. grandifoliola - Broad-leaved Mahogany, Acajou, Benin Mahogany;

K. ivorensis - Nigeria/Benin/Lagos/Degema Mahogany, Acajou d'Afrique, Acajou blanc, Kongombe, Doukouma, Grand-Massam Mahogany;

K. nyasica - Umbawa (Mozambique).

16. Code Numbers:

2. Biological Data

Most data is contained in various monographs and part-work floras concerning *Khaya* [see Keay (1958), Pennington & Styles (1975), White (1962), White & Styles (1963), and Styles & White (1991)].

21. Distribution: *Khaya* species are distributed throughout mainly tropical Africa and Madagascar and the Comores (Styles & White, 1991).

The distribution of each species is as follows:

K. anthotheca - Angola, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone, United Republic of Tanzania, Uganda, Zaire;

K. grandifoliola - Benin, Côte d'Ivoire, Ghana, Guinea, Nigeria, Sudan, Togo, Uganda, Zaire;

K. ivorensis - Coastal rainforest of West Africa - Angola, Cameroon, Côte d'Ivoire, Gabon, Ghana, Liberia, Nigeria;

K. madagascariensis - Madagascar;

K. nyasica - Malawi, Mozambique, United Republic of Tanzania, Zaire, Zambia, Zimbabwe;

K. senegalensis - Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Gambia, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone, Sudan, Togo, Uganda.

22. Population: In 1980 the area of tropical forest (including open and closed forest) remaining in Africa was 7,030,790 km² (Lanly, 1982). Many African countries have experienced a long history of commercial timber exploitation and the African timber trade accounts for around 8% of the total world market by volume (ITTO, 1991). In its 1988 summary report, FAO stated that between 1981-1985 deforestation in Africa had reached an annual average of 36,760 km² (includes open and closed forests). By 1991 annual deforestation in the region for the preceding decade had reached 41,000 km² (FAO, 1993). It appears that as long as the pressures of commercial exploitation on valuable timber genera such as *Khaya* remains high this group is worthy of particular conservation attention (ITTO, 1991).

All species of *Khaya* have declined considerably in recent decades and continue to suffer depletion and biological degradation as a result of over-exploitation and deforestation. Stocks in Africa are cited as being low and in danger of severe genetic erosion and, at present felling rates, some authorities estimate that *Khaya* species will have disappeared by 2010 as already demonstrated in southern Nigeria and other parts of West Africa (Styles, *in litt.* 1993). In Ghana *Khaya* species have an estimated resource life of 20 years (Alder, 1989) and, although Greenway (1947) reported that this genus was not utilized greatly by the indigenous peoples in East Africa, the demand for timber from this genus for local consumption has now outstripped the supply (Shete, *in litt.* 1993). The conservation status of the species is as follows (IUCN Red Data Book Categories used; see also Table 1):

K. anthotheca - vulnerable (Côte d'Ivoire), endangered (Liberia), threatened (Uganda). Heavy exploitation is affecting regeneration in Ghana. FAO considers this species a priority for *in situ* conservation (FAO, 1986; 1990 a).

K. grandifoliola - vulnerable (Benin), endangered (Uganda). FAO considers this species a priority for *in situ* conservation (FAO, 1986; 1990 a).

K. ivorensis - vulnerable (Cameroon & Côte d'Ivoire), endangered (Liberia). FAO considers this species a priority for *in situ* conservation (FAO, 1986; 1990 a). Subject to overlogging in Ghana (ITTO, 1991). This species has now almost disappeared from the evergreen forests which form part of the western block of African tropical moist forests.

K. nyasica - This species is a desirable timber and is endangered along many rivers, although less so in moist forests, many of which are under some form of protection (Zimbabwe Forestry Commission *in litt.* to Wildlife Trade Monitoring Unit, 1991). Stands in Mozambique have declined due to heavy exploitation for international trade some years ago.

K. senegalensis - Cited as vulnerable in Benin and endangered in Uganda. FAO considers it endangered in northern parts of its range and populations to be in danger of genetic erosion in West Africa and in need of *in situ* conservation (FAO, 1986; 1990 a).

23. **Habitat:** *Khaya* species are tall, emergent trees of rainforest, riparian forest and savanna and often found in fringe areas between rain forests and savannas. *K. senegalensis* only occurs in the drier northern parts of West Africa and is restricted to open woodland savanna, often rocky places, and fringing forest of the drier forest types. *K. anthotheca* inhabits lower rainfall regions than *K. ivorensis*.

3. International and National Trade Data

The EC is a main importer of tropical hardwoods, including logs and all types of processed timber (Table 2). By value the EC is the largest importer of tropical hardwoods in the world (Rice & Counsell 1993).

Africa is the major source for raw logs, whereas Asia exports the largest proportion of sawn timber and further processed timber goods (Table 3). The export trade in African timbers involves mainly West and Central African countries (Sayer *et al.*, 1992). The EC is the recipient of 90 % of the African tropical timber exports (Table 4). Africa is the main source of EC log imports.

As Table 5 shows, Central Africa's share of the trade has increased. This is because most of West Africa's natural forests are being exploited. The West African subregion shows an advanced phase of forest depletion: the closed forest is split into several islands in a "sea" of mixed agriculture/forest fallow (FAO 1990 b).

Another reason for the growing commercial interests in Central Africa is that there are still unlogged forests in remote areas and that in Africa many tree species, including most of the commercially important timbers, cover wider ranges than in SE Asia and Latin America (Sayer *et al.*, 1992). In comparison to SE Asia, where a large number of species (mainly Dipterocarps) have economic importance, West and Central Africa rely on relatively few high value species. Few species in Africa are threatened throughout their natural geographical range, but various timbers are threatened with extinction within certain countries because of over-exploitation (ITTO, 1991).

All *Khaya* species except *Khaya madagascariensis* have had a long history in international trade (ITTO, 1991). Due to similarities in colour and texture between the species and to another timber group of commercial importance, the 'true' mahoganies (*Swietenia* spp.), it is often difficult to determine which individual species are in trade as they are often traded under the blanket heading of 'mahogany' or 'acajou d'Afrique'. For UK imports see Table 6.

31. Timber: The general term of 'African Mahogany' is used to cover all species of *Khaya*. More specific names are sometimes used for the individual species or for timber from a particular port or locality. West African Mahogany is mainly the product of *K. ivorensis*. Shipments from certain areas may include *K. anthotheca* and *K. grandifoliola*, *K. grandifoliola* and *K. senegalensis* are both sold as heavy African Mahogany and sometimes mixed with shipments of lighter species. In the USA wood is sold as 'Khaya' to avoid confusion with Central or South American Mahogany.

The UK has been importing African mahogany since the formation of the Royal Africa Company in 1672 (Latham, 1957). West African countries and, in particular, Côte d'Ivoire were the first to develop their production of timber (Farmer, 1972). The African mahoganies vary in quality with the locality of growth. At best, it is only slightly inferior to average quality Central and South American mahogany. As supplies became exhausted, trade showed a marked shift in emphasis from African to South and Central American mahogany species in the mid-1970s and towards the latter part of the decade increasing reliance on South East Asian substitutes (Knees & Gardner, 1983).

The timber of *K. grandifoliola*, being considerably harder and heavier than the general run of African mahogany, is more suitable where strong, harder-wearing wood is required, as for counter tops and block flooring. However, because trees tend to branch low down the amount of wood available is rather small (Styles & White, 1991). It has been suggested that demand for *K. anthotheca* will probably increase (in Liberia) when stocks of *K. ivorensis* become exhausted (Voorhoeve, 1979).

31. Legal International Trade: African mahogany is exported in log form or as sawn timber from all timber-producing countries of West Africa, the principal sources being Côte d'Ivoire, Ghana, Cameroon and Nigeria. Small quantities of sawn timber have been shipped from East Africa. Plywood is manufactured for export in Ghana, Nigeria and Côte d'Ivoire, and in various European countries and Israel. Import data on individual species is difficult to obtain as individual species are traded together under general headings such as 'mahogany' or acajou d'Afrique. Refer to accompanying trade data in Table 6.

32. Illegal Trade: No detailed information available.

4. Protection Status

41. Species Protection: No *Khaya* species are protected by international law. Various measures have been made nationally in an attempt to protect species from over-exploitation:

K. anthotheca - Legally protected in Côte d'Ivoire and given some degree of protection within the Permanent Protection Forests in the Congo under Law No. 004/74 (ITTO, 1991). Minimum exploitable diameter for this species in Congo is 0.8 m and a ban on the export of timber in log form was introduced in Ghana in 1979. A ban on the export of this species from Liberia in log form was proposed in 1990 to be effective from 1 October 1990 under FDA Regulation No. 17 (ITTO, 1991). This species occurs in a number of protected areas including Mont Peko, Côte d'Ivoire.

K. grandifoliola - Legally protected under Decree No. 66-122, 31 March 1966, in Côte d'Ivoire. Under the decree, uprooting or damage to this species is prohibited, as is the destruction of their fruits and seeds. A ban on the export of timber in log form was introduced in Ghana in 1979 (ITTO, 1991). This species occurs in a number of protected areas including Dja National Park, Cameroon, and Mont Peko, Côte d'Ivoire.

K. ivorensis - Legally protected under Decree No. 66-122, 31 March 1966, in Côte d'Ivoire. Under the decree, uprooting or damage to this species is prohibited, as is the destruction of their fruits and seeds. A ban on the export of timber in log form was introduced in Ghana in 1979. A ban on the export of this species from Liberia in log form was proposed in 1990 to be effective from 1 October 1990 under FDA Regulation No. 17 (ITTO, 1991). This species occurs in a number of protected areas including Campo Faunal Reserve, Cameroon and Bia National Park, Ghana.

K. senegalensis - Protected by national legislation in Chad, Gambia, Niger and Senegal and also under the Agreement on the Joint Regulations on Fauna and Flora signed by Cameroon, Chad, Nigeria and Niger (FAO, 1986; 1990 a). From available records, this species can be found in the Southern Guinea Savannah in Strict Natural Reserves (SNR's) numbers 7, 9, 10, and 12 of the Abuja Local Government, Federal Capital Territory Lapai-Gulu town, Alawa town and Zugurma Games Reserve of Niger State (Ogigirigi, *in litt.* 1993)

A differential log export tax, the Industrialisation Incentive Fee, has been imposed on all *Khaya* species in Liberia (ITTO, 1991).

Khaya species are also found in the Akure (average of 2 trees per hectare in 1974), Idanre (average of 10 trees per hectare in 1984), Omo (average of 30 trees per hectare in 1946), Sapoba (average of 60 trees per hectare in 1957) and Usonigbe (average of 10 trees per hectare in 1978) Forest Reserves in Nigeria (Ogigirigi, *in litt.* 1993). Despite the high demand for these species, no comprehensive conservation measures have been implemented in East Africa. In the United Republic of Tanzania logging is carried out in national forest reserves provided one has a relevant government issued permit. This is also the case in Kenya where, despite this genus only being confined to the Kakamega Forest, selective logging is still being carried out (Shete, *in litt.* 1993).

42. Plantation Development: Experiments with plantations of *Khaya* under the Tropical Shelterwood System in Côte d'Ivoire have proved successful, but costly (FAO 1989) and plantations which have been established in Cuba appear to be successful (Styles, *in litt.* 1993). A mix with *Erythrophleum* and teak has been recommended and success has been achieved using Taungya sequential cropping plans. Attack from *Hypsipyla* species (shoot-borers) is one of the few factors which prevent the more extensive use of *Khaya* species in plantation forestry and if more tolerant genotypes could be identified the use of vegetative propagation, as developed for other tropical hardwoods, could be adapted to these species (Knees & Gardner, 1983). The West African Hardwoods Improvement Project, the Tree Crop Protection Division and the Entomology Division of the Forestry Institute, Nigeria are co-operating to develop *Hypsipyla* shoot-borer resistance in species of *Khaya* (Ogigirigi, *in litt.* 1993) and the Forestry Research Institute of Nigeria is conducting breeding and entomology studies of these species in order to control this pest (Ogigirigi, *in litt.* 1993).

Although *Khaya* species are grown in tree nurseries in afforestation programmes in East Africa, no significant importance is attached to this genus as compared to other indigenous tree species. In the United Republic of Tanzania, where deforestation is currently quoted at 300,000-400,000 hectares per annum, 11 tons of seed (out of a required 29 tons) are planted annually through the National Tree Seed Project supported by DANIDA. Over 80,000 hectares of industrial plantations are already planted with exotic species, thus significantly reducing the number of hectares under indigenous species such as *Khaya* (Shete, *in litt.* 1993).

K. anthotheca - This species is widely grown in plantations in the United Republic of Tanzania (Styles & White, 1991) and is one of the most valued timber species in Uganda where it was formerly used for enrichment planting in the South Mengo forests. It used to

provide nearly one half of the converted timber from the Budongo Forest, although this practice halted in 1954 due to a shortage of labour, damage from insects and large mammals and the renewed confidence in natural regeneration (Synnott, 1985).

K. ivorensis - Experiments in Cameroon have shown that this species is amenable to vegetative propagation using low-technology, non-mist propagators at the Mbalmayo Forest Reserve (ITTO, 1991) and is among several native species used in plantation development in Ghana (ITTO, 1991). Seed viability of *K. ivorensis* is low and success in cultivation is achieved through direct sowing into clearings. Insufficient side-shade and too dense plantings are reported to aggravate attack from *Hypsipyla*, and monocultures are to be avoided.

K. senegalensis - As with *K. ivorensis*, seed viability of this species is low and success in cultivation is achieved through direct sowing into clearings. Insufficient side-shade and too dense plantings are reported to aggravate attack from *Hypsipyla* and monocultures are to be avoided.

5. Information on Similar Species

51. *Entandrophragma*: Another African genus of the family Meliaceae which produces a timber very similar to *Khaya*. Timber of the two genera are sometimes shipped together under the blanket heading of African Mahogany. The term 'Sapele Mahogany' or 'sapele wood', originally applied to mahogany-type timber shipped from Nigerian port of Sapele, is now generally restricted to the timber of *E. cylindricum*.

6. Comments from Countries of Origin

The following range States expressed an interest in supporting the listing of *Khaya* in Appendix II at the next meeting of the Conference of the Parties: Gambia, Liberia, Malawi and Senegal.

7. Additional Remarks

8. References

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Table 1: Distribution and IUCN Threat Assessments for Entandrophragma and Khaya Species.

IUCN Threat Categories: E = Endangered, V = Vulnerable, R = Rare, C = T = gefährdet, Zuordnung zu E, V oder R noch unklar.																																								
Country Abbreviations:																																								
AO = Angola	CG = Congo	GN = Guinea	ML = Mali	RW = Rwanda	TZ = Tanzania	BF = Burkina Faso	CI = Cote d'Ivoire	GW = Guinea-Bissau	MW = Malawi	SD = Sudan	UG = Uganda	BJ = Benin	CM = Cameroon	GQ = Equat. Guinea	MZ = Mozambique	SL = Sierra Leone	ZA = S. Africa	BI = Burundi	GA = Gabon	KE = Kenya	NA = Namibia	SN = Senegal	ZM = Zambia	BW = Botswana	GH = Ghana	LR = Liberia	NE = Niger	TD = Chad	ZR = Zaire	CF = Central Afr. Rep.	GM = Gambia	MG = Madagaskar	NG = Nigeria	TG = Togo	ZW = Zimbabwe					
KHAYA																																								
anthotheca	AO	CF	CG	CI	CM	GH	GN	LR	NG	SL	TZ	UG	ZR																											
grandifoliola	AO?	BJ		CI		GH	GN		NG	SD	TG	UG	ZR																											
ivorensis	AO			CI	CM	GA	GH	LR	NG																															
madagascariensis								MG																																
nyasica									MW	MZ		TZ	ZM	ZR	ZW																									
senegalensis	BF	BJ		CI	CM	GW	GN	GW	ML	NE	NG	SD	SL	SN	TD	TG	UG																							
ENTANDROPHRAGMA																																								
angolense	AO			CG	CI	CM	GA	GH	GN	KE	LR	NG	SD	SL	UG	ZR																								
bussei																TZ																								
candollei	AO			CG	CI	CM	GA	GH	GN	LR	NG																													
caudatum		BW								MW	MZ	NA																												
congoense						GA																																		
cylindricum	AO			CF	CG	CI	CM	GA	GH		LR	NG	SL	TG	UG	ZR																								
delevoyi																TZ																								
excelsum		BI							KE	MW	RW					TZ	UG																							
palustre				CG																																				
spicatum	AO																																							
utile	AO			CF	CG	CI	CM	GA	GH		LR	NG	SL	UG	ZR																									
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Table 2: Comparison of volume and value of tropical hardwoods by most important countries (1990).

Country	Volume (millions of m3 roundwood equiv.)	Value (millions of ECU)
Japan	21,31	2.912
EC	13,36	2.959
USA	5,74	1.671
S-Korea	6,75	661
Taiwan	5,49	519

Source: Rice & Counsell (1993), *Forests Foregone. The European Community's Trade in Tropical Timbers and the Destruction of the Rainforests.*

Table 3: Volume of tropical timber exports into EC by regions of origin in 1990 (m3).

Region	Import of logs	Import of Processed Wood (roundwood equivalent)
Africa	3.321.954	2.313.117
SE-Asia	31.766	6.717.189
Latin-America	16.757	735.069

Source: Rice & Counsell (1993), *Forests Foregone. The European Community's Trade in Tropical Timbers and the Destruction of the Rainforests.*

Table 4: Volume of timber imports into the EC and Germany by African countries of origin in 1990 (m3).

Country	Logs		Processed wood (roundwood equivalent)		Total (roundwood equivalent)	
	EC	Germany (%)	EC	Germany (%)	EC	Germany (%)
Cot d'iv.	401.827	6.550 (1,6)	1.010.673	93.015 (9,2)	1.412.500	99.565 (7,0)
Ghana	143.169	115.878 (81,0)	364.981	83.803 (23,0)	508.150	199.681 (39,3)
Liberia	514.853	67.049 (13,0)	21.270	4.257 (20,0)	536.123	71.306 (13,3)
Nigeria			31.996	10.784 (33,7)	31.996	10.784 (33,7)
Cameroon	666.459	51.986 (7,8)	328.659	8.432 (2,6)	995.118	60.418 (6,1)
Eq Guinea	125.264	12.487 (10,0)	20.810	519 (2,5)	146.074	13.006 (8,9)
Congo	569.641	35.574 (6,2)	115.503	28.911 (25,0)	685.144	64.485 (9,4)
Gabon	763.875	20.422 (2,7)	57.847	483 (0,8)	821.722	20.905 (2,5)
CAR	26.138	3.032 (11,6)	26.920	328 (1,2)	52.158	3.360 (6,4)
Zaire	94.212	11.013 (11,7)	57.195	4.057 (7,1)	151.407	15.070 (9,9)
Others	16.516	1.817 (11,0)	83.569	8.936 (10,6)	100.485	10.753 (10,7)
Africa	3.321.954	325.808 (9,8)	2.118.923	243.525 (11,5)	5.440.877	569.333 (10,5)

Source: Rice & Counsell (1993), Forests Foregone. The European Community's Trade in Tropical Timbers and the Destruction of the Rainforests.

Table 5: Volume of tropical timber imports from West and Central Africa into the EC in 1990 (m3).

Region	Logs	Processed Wood	Processed Wood (in r'wood equiv.)
West Africa ¹	1.059.849	776.894	1.633.000
Central Africa ²	2.245.589	322.710	678.000

¹ Includes only exporting countries: Cote d'Ivoire, Ghana, Liberia, Nigeria

² Includes exporting countries: Cameroon, Eq Guinea, Congo, CAR, Gabon, Zaire

Source: Rice & Counsell (1993), Forests Foregone. The European Community's Trade in Tropical Timbers and the Destruction of the Rainforests.

Table 6: TRADE DATA FOR *KIAYA* SPECIES

EXPORTS		EXPORTING COUNTRY	YEAR	VOLUME	FORM	OTHER DATA
KIAYA SPECIES						
		CONGO	1988	3,412m ³	LOGS	
		COTE D'IVOIRE	1988 (11 MONTHS)	1,305,052m ³	LOGS	
		LIBERIA	1988	5,231m ³	LOGS	
<i>K. worense</i>		GHANA	1986	1,675m ³	LUMBER	LOG EXPORT BANNED
			1987	1,598m ³	LUMBER	
			1988	905m ³	LUMBER	
			1989	1,305m ³	LUMBER	
			1990	2,996m ³	LUMBER	
			1991	5,311m ³	LUMBER	
			1992	5,743m ³	LUMBER	
			1993	N/A	LUMBER	
			1994	N/A	LUMBER	
			1995	10,463m ³	LUMBER	
UK IMPORTS		EXPORTING COUNTRY	YEAR	VOLUME	FORM	OTHER DATA
KIAYA SPECIES						
Azou d'Afrique (<i>K. anthothoe</i> & <i>K. worense</i>)		CAMEROON	1989	673 tonnes	SAWN WOOD/LOGS	
			1989	194 tonnes	SAWN WOOD/LOGS	
			1987	424 tonnes	SAWN WOOD/LOGS	
		CONGO	1986	79 tonnes	SAWN WOOD/LOGS	
		COTE D'IVOIRE	1986	7,051 tonnes	SAWN WOOD/LOGS	
			1986	9,116 tonnes	SAWN WOOD/LOGS	
			1987	4,087 tonnes	SAWN WOOD/LOGS	
			1988	6,116 tonnes	SAWN WOOD/LOGS	
			1989	5,024 tonnes	SAWN WOOD/LOGS	
		CAMEROON	1986	84 tonnes	SAWN WOOD/LOGS	
		GHANA	1985	1,522 tonnes	SAWN WOOD/LOGS	
			1986	15 tonnes	SAWN WOOD/LOGS	
			1987	3,131 tonnes	SAWN WOOD/LOGS	
			1988	2,917 tonnes	SAWN WOOD/LOGS	
			1989	2,129 tonnes	SAWN WOOD/LOGS	
		LIBERIA	1985	764 tonnes	SAWN WOOD/LOGS	
			1986	286 tonnes	SAWN WOOD/LOGS	
			1988	40 tonnes	SAWN WOOD/LOGS	
		NIGERIA	1987	1,050 tonnes	SAWN WOOD/LOGS	
			1988	465 tonnes	SAWN WOOD/LOGS	
			1989	41 tonnes	SAWN WOOD/LOGS	
		ZAMBIA	1989	1,332 tonnes	SAWN WOOD/LOGS	
			1988	19 tonnes	SAWN WOOD/LOGS	
			1989	111 tonnes	SAWN WOOD/LOGS	
			1989	62 tonnes	SAWN WOOD/LOGS	

SOURCE: UK CUSTOMS & EXCISE (1990); ITTO (1991) (N/A = Not available)