

AMENDMENTS TO APPENDICES I AND II OF CITES

Other Proposals

A. PROPOSAL

Inclusion of *Guaiacum officinale* in Appendix II.

B. PROPONENT

The United States of America.

C. SUPPORTING STATEMENT

1. Taxonomy

10. Division: Magnoliophyta (angiosperms; flowering plants)
11. Class: Magnoliopsida (dicotyledons)
12. Order: Sapindales
13. Family: Zygophyllaceae
14. Genus: *Guaiacum* Linnaeus (4-5 spp.; see Porter 1972)  
[syn. = *Guajacum* L.]

141. Species: *G. officinale* Linnaeus 1753
- \*Now in App. II: \**G. sanctum* Linnaeus 1753  
[syn. = *G. verticale* Gómez Ortega 1798;  
⇒ see §1422. ⇒ *G. guatemalense* Planchon ex Rydberg 1910]

NOTE: This proposal provides information on the currently listed *G. sanctum*; no amendment regarding this species is intended.

141A. Non-CITES *Guaiacum* Taxa (see §51.):

- G. coulteri* A. Gray 1855  
[syn. = *G. planchonii* A. Gray ex Rydberg]  
var. *coulteri*
- G. coulteri*  
var. *palmeri* (Vail) I.M. Johnston 1924  
[syn. = *G. palmeri* Vail]
- G. unjugum* T.S. Brandegee 1915

142. Natural Hybrids (Porter 1972):

1421. In the northern island Caribbean, *Guaiacum officinale* and *G. sanctum* are both native in four areas: the Bahamas, Cuba, Hispaniola, and Puerto Rico. Hybrids are not known to occur (Porter com. USFWS 1991).

1422. Specimens found in Guatemala to Costa Rica sometimes have been identified as *Guaiaacum guatemalense* [cf. Record & Hess 1943; Beekman 1964 (Nicaraguan lignum-vitae); Martínez 1969; also Standley & Calderón 1925 and §42.]. Standley & Steyermark (1946) decided that *G. guatemalense* was a synonym of *G. sanctum* (cf. Little & Wadsworth 1964; Chickering 1973).

However, *Guaiaacum coulteri* ranges southward from S México into [western] Central America to an unknown extent (§21.A), thus living where *G. sanctum* is native. Porter (1972) surmised that rather than a synonym, *G. guatemalense* may represent extensive hybridization occurring between *G. coulteri* and *G. sanctum* where both occur. [His view was based on morphological evidence (including lower seed-set) from the limited number of herbarium specimens available then.]

Either as a synonym or hybrid, the specimens of *Guaiaacum guatemalense* are regulated. If *G. guatemalense* is treated as representing plants of hybrid origin, it is subject to the provisions of the Convention in accord with Resol. Conf. 2.13 b), with no protection for hybrids themselves, in accord with Resol. Conf. 2.13 d).

The Parties need to decide how to treat the name *G. guatemalense*. If it is treated as a hybrid, to what specimens, and in what range, would the name apply? Porter (com. USFWS 1991) suggested that *Guaiaacum guatemalense* be treated as a synonym of *G. sanctum*, until research determines the southern range of *G. coulteri*, and confirms (or refutes) hybridization in *G. guatemalense* and finds out its general geographical extent and biological characteristics. Then CITES judgements could be made without considerable speculation.

15. Common Names: (for others, see e.g. Record & Hess, 1943; Little & Wadsworth, 1964)

Spanish: guayacán, guayaco, palo santo, palo sano, guayacán genuino, guayacán negro

English: lignum-vitae, commoner lignum-vitae, wood of life, tree of life, guayac

French: gaïac, gaïac mâle, gaïac officinal, bois de gaïac, bois de vie, bois saint

Portuguese: guaiaco, pau santo

Note: Occasionally "lignum-vitae" is used with other timber species; see §52.. As well, "guayacán" is used regularly for *Tabebuia* timber species (Bignoniaceae), *Caesalpinia melanocarpa* Grisebach (Fabaceae), and *Andropogon angustatus* (Presl) Steudel (Poaceae) (cf. Mabberley, 1989; Beekman, 1964; Schnee, 1973).

## 2. Biological Data

The species of *Guaiaacum* are very slow-growing, in dry forests to scrub. A *Guaiaacum sanctum* tree living in southern USA (Florida) was estimated to be over 1000 years old (Wilson & Eisner, 1968). In an experimental regime, nevertheless, *G. officinale* was found easy to propagate, the seeds germinating readily (yet able to remain

dormant), with plants attaining 30-50 cm in 2 years (Fors, 1936). If not overexploited, *Guaiaecum* plants tend to be plentiful in an area (e.g. Shelford, 1963; Sloane ex Pertchik & Pertchik, 1951; Storer, 1958; Marie-Victorin & Léon, 1942; Liogier, 1985; Garcia-Molinari, 1952; Watts, 1966; Pertchik & Pertchik, 1951; Storrs, 1984).

21. Distribution (Porter, 1972; generalized map: §21.A.)

211. *Guaiaecum officinale*: Along an eastern arc of the wider Caribbean region: from the N islands eastward and southward, then westward across N South America: the Bahamas and Greater Antilles (including Jamaica) E through the Lesser Antilles to Barbados, the Netherlands Antilles, Venezuela and Colombia. D'Arcy (1987), Porter (1969, 1972) and Duke (1986) do not include Panamá within its native range, ± implying plants reported in 1964 (Ceiba 10: 35-36) were cultivated [Record & Hess (1943) had mapped *Guaiaecum* into NE Panamá]. In addition, Guyana and Tobago are no longer considered to have been within its native range (Howard, 1988; Mennega *et al.*, 1988; Marshall, 1934). It is unclear whether it is native on Dominica (Howard, 1988; DeFilipps in Nicolson, 1991). In the wild, this species is addressed by: Correll & Correll, 1982; Bisse, 1988, León & Alain, 1951; Adams, 1972, Storer, 1958, Fawcett & Rendle, 1920; Liogier, 1985, 1978; Little & Wadsworth, 1964; Howard, 1988; Fournet, 1978; Gooding *et al.*, 1965; Gooding, 1973; Stoffers, 1984; Lasser, 1971, Schnee, 1973.

See §312.) for this species' rather frequent cultivation, including many plants within its native range.

212. *Guaiaecum sanctum*: Along a western arc of the wider Caribbean region: from southern Central America, northward and eastward through the Greater Antilles and further NE: Costa Rica to México (Yucatán), then ENE to Cuba, USA (S Florida), Bahamas, Hispaniola, and Puerto Rico. D'Arcy (1987) and Porter (1969, 1972) do not include Panamá within its natural distribution [Record & Hess (1943) had mapped *Guaiaecum* into SW Panamá]. The Netherlands Antilles seems to be treated as part of its native range by Stoffers (1984). The natural occurrence of this species is presented in: Holdridge & Poveda, 1975; Standley & Steyermark, 1946; Standley, 1923, Téllez Valdés & Sousa Sánchez, 1982; Bisse, 1988, León & Alain, 1951; Elias, 1980, Little, 1978, West & Arnold, 1956; Correll & Correll, 1982, Patterson & Stevenson, 1977; Liogier, 1985, 1978; and Little & Wadsworth, 1964.

See §312.) for the occasional cultivation of this species, including plants within its native range.

22. Populations

221. Most populations of *Guaiaecum officinale* and *G. sanctum* have diminished from collection for ≈ 400-500 years, for use of the wood itself or a medicinal decoction from it (see §311.). To a considerable extent, it seems collectors in practice have not been selective between these species (although readily told apart), but actually have cut either or both to satisfy the same trade demands. However, with increase of experience and awareness, *G. officinale* has been regarded as having the superior wood (e.g. Record & Hess, 1943). A few centuries ago, *G. sanctum* may

have been preferred for medicinal use (*cf.* Munger, 1949; Kimber, 1988; Lewis & Elvin-Lewis, 1977); in the past century both appear to have been satisfactory (Wren & Wren; Standley, 1923). Natural populations of *Guaiaacum* species generally continue to be depleted by collection. With decline of *G. officinale* and *G. sanctum*, collection of *G. coulteri* may be expanding.

222. *Guaiaacum officinale* is a small tree (to shrub) 3-10(-15) m tall with a short trunk 12-45(-90) cm in diameter. Since about 1508, commercial exploitation has reduced and/or distorted most of its populations through its natural range, especially severely in the Lesser Antilles. Status information on various populations has been reported as follows:

| Area   | Comments   | Source (Ref. 58)                       |
|--|--|--|
| Venezuela  | One of the woods most in demand; becoming scarce and rarely encountered around ports. Amply distributed through the xerophilous coastal dryland zone   | Pittier, 1926; Schnee, 1973            |
| Netherlands Antilles                                 | Common   | Stoffers, 1984                         |
| Lesser Antilles                                      | Harvested for many years; native stands near extirpation on many islands. Often only isolated, single trees reported   | Howard, 1988                           |
| Barbados   | After 1650, sp. continued to be extensively cut and exported. By 1965, 1973: seldom found out of cultivation   | Watts; Gooding <i>et al.</i> ; Gooding |
| Guadeloupe & Martinique                              | From abusive exploitation, species has practically disappeared   | Fournet, 1978                          |
| Martinique   | By 1667-1671: 1 of 2 spp. most sought-after for industrial purposes. By 1689: little left. Unforceable 1701 rule limited use to pulleys for naval ships. Species progressively scarcer, yet remained on price lists to 1777. By 1897: scarce outside cultivation | Kimber, 1988                           |
| Guadeloupe   | By 1667-1671: none left except on remote half of Grande-Terre [the NE main island]   | Kimber                                 |
| Outer Leeward Islands: Antigua and Barbuda, Anguilla | Probable sp. once among dominants, by 1965: Extirpated — Antigua (by 1725, sp. already in short supply; by 1790, no longer on export list). Near-extirpation — Barbuda, Anguilla. [Buccaneers began selective felling; intensified after colonization]           | Harris                                 |
| Virgin Islands                                       | By 1964: nearly extirpated outside cultivation   | Little and Wadsworth                   |
| Puerto Rico  | Rare because of exploitation; large trees not found  | USDA SCS & PR DNR; Silander            |

| Area       | Comments   | Source<br>(Ref. #8)   |
|------------|--|---|
| Hispaniola | Common [1985]; but in Dominican Republic (or generally): Due to pitiless felling, species daily becomes rarer — since wood is hard, used to make good charcoal. From Haïti, considerable "lignum-vitae" was exported even in 1951. But current data (§3.1A.1), and the recently offered export products just of sapwood (even for mallets), suggest older trees with the harder heartwood are not available; cf. IUCN, <u>Neotrop. Protected Areas</u> | Liogier, 1985, 1978; Cantwell, 1991; Hill, 1937; Longwood, 1962; IUCN, 1982 |
| Cuba       | Not in Borhidi & Muñiz (1983), <u>Pl. Amenaz.</u> , but Cuba participated in 11/90 & 6/91 SPAW meetings  | CEP, 1990b, 1991  |
| Jamaica    | Early 1700s, grew everywhere in ... S Jamaica. By 1946: relatively little exportable — most remaining trees too small; small quantities still being shipped. In 1972: locally common. Not in Kelly (1988), <u>Thr. fl. pl. Jamaica</u> , but Jamaica participated in 11/90 & 6/91 SPAW meetings  | Sloane in Pertchik & Pertchik; Swabey; Adams; CEP, 1990b, 1991              |

23. Habitat: The species of *Guaiaecum* occur in tropical to subtropical dry forest to scrub (e.g. Ewel & Whitmore, 1973). *Guaiaecum officinale* grows near the coast and at lower elevations inland, in woodlands, thickets and pastures, on hillsides and plains.

### 3. International and National Trade Data

31. National Utilization and ± Legal International Trade: International and national trade and utilization in *Guaiaecum* species chiefly involve their wood (e.g., see Walker, 1989; Lewington, 1990; Bramwell, 1976; Edlin *et al.*, 1978; Linnell & Arnould *n.d.*; Whitmore, 1980, 1981; Contantine 1959; Coleman, 1966; Titmuss, 1965; Bond, 1950; FPRL, 1956; Chudnoff, 1984). Lignum-vitae is among the heaviest woods; its high density and content of oily resin, and fine texture suit it for products such as bushings and bearings for ship propeller-shafts, pulley sheaves, thrust blocks and bearings, caster wheels, rollers, guides, and washers (used in a broad medley of machinery), and in die cutting. The wood also continues to be sought for turnery (e.g. mallet-heads, goblets, bowls). A new technology upgrading the production of rubber bearings may be decreasing the need for lignum-vitae bearings (Yeaple, 1988).

Hegnauer (1973, 1990) has compiled the information from chemical studies of *Guaiaecum* species. Any modern industrial interest in dye from *Guaiaecum officinale* (cf. Cook & Collins, 1903; Kimber, 1988) has not been discovered, but perhaps exists. Minimal medicinal attention continues, in local remedies (Morton, 1981; Ayensu, 1981; Honychurch, 1980; cf. Martínez, 1969) and internationally (Bossard, 1978; Tierra *et al.*, 1988; Crété, 1965); the medicinal material may be termed, e.g., gum guaiac, guaiac resin, guaiacum, lignum vitae, lignum sanctum.

Recent international commerce is suggested by the sampled trade data following in §31.A (also Oldfield, 1988; TPC, 1982); for earlier times: e.g. Record, 1921b; Harris, 1965; Kimber, 1988. These Customs data give only general information on volumes of wood traded internationally: the commodity categories changed; direct correlation to species is not possible; the country provided is not definitely the originating country (i.e. where the trees grew).

**"LIGNUM VITAE" IMPORT TO JAPAN FROM MEXICO (& once, ← Indonesia)**

| Tariff Schedule   | Sawlogs            |         | Sawn Wood (lumber) (n.e.s.) |        | Sawn Wood (worked) (n.e.s.) |                     |
|---|--------------------|---------|-----------------------------|--------|-----------------------------|---------------------|
|   | Quantity           | Value   | Quantity                    | Value  | Quantity                    | Value               |
| 44.03-334 ><br>4403.10-230*<br>+ 4403.99-399*   |                    |         | 4407.99-490<br>= 44.05-594  |        | 4407.99-410<br>< 44.13-590* |                     |
| m <sup>3</sup> , 1000 yen   | Quantity           | Value   | Quantity                    | Value  | Quantity                    | Value               |
| 1985  | 414                | 122,789 | 22                          | 20,254 | *17                         | 6,597               |
| 1986  | 762                | 167,696 | 16                          | 8,480  | 0                           |                     |
| 1987  | 0                  |         | 5                           | 2,549  | 0                           |                     |
| 1988  | *223               | 27,125  | 11                          | 6,210  | 17←                         | 644                 |
| 1989  | *760               | 138,417 | 9                           | 5,046  | 0                           |                     |
| Total   | 1,176<br>or *2,159 |         | 63                          |        | *17<br>or *34←              | [ <i>Premna</i> ←?] |
| * Category not exclusively lignum-vitae: 44.13.590 [worked wood, n.e.s.]; and 4403.99-399 [wood in the rough, n.e.s.] and 4403.10-230 [treated wood in the rough, n.e.s.] – 0 from latter in the 1988 & 1989 Qs above |                    |         |                             |        |                             |                     |

**"LIGNUMVITAE" IMPORT TO USA FROM MEXICO (& once, HAITI) (manifests)**

| Tariff Schedule | ROUGH LUMBER (m <sup>3</sup> )<br>4407.30-5215 |
|-----------------|--|
| 1984            | 53 (51 México + 2 Haïti)                       |
| 1985            | 26   |
| 1986            | 0  |
| 1987            | 0  |
| 1988            | 14   |
| 1989            | 43   |
| Total           | 136  |

311. Early Trade Effects: An intensive international lignum-vitae trade began nearly five centuries ago with exploitation of *Guaiacum* for medicinal use in Europe, when it became known (~ 1508) that the Amerindians (e.g. the Arawaks) made a decoction from it to treat the venereal disease

syphilis (Harris, 1965; Milne & Milne, 1975; Standley, 1923). For over two centuries, there was strong demand for heartwood to prepare the extract, which was generally deemed as one of the two major remedies for syphilis (Crosby, 1972; White, 1951; Record & Hess, 1943; Porter, 1972); until 1909, some administration of this treatment may have continued (Milne & Milne, 1975). The status of the *Guaiaecum* populations before 12/10/1492, and the severity and effects of the persistent collection on the species, can be inferred somewhat from the fervor of this early attention and chronic trade demand (Munger, 1949; Castiglioni, 1943): e.g., von Hutten 1519; Fernández de Oviedo 1526; Fracastoro 1530; Pol 1535; Ferri 1547; Monardes 1568; Hernández [ms. ex 1570-1575] ≥ 1628-1651; Canevari 1602; Sloane [1707-1725] ex Pertchik & Pertchik, 1951; Harris, 1965; Kimber, 1988. In the 1520s-1530s, the belief that *the cure* for [the recently introduced] syphilis (and the alleviation of other ailments) came from lignum-vitae even created a craze (repeated a few generations later) that "drove its price to dizzy heights" — as much as 7 gold crowns per pound (lb.) of this very heavy wood (Crosby, 1972; Record & Hess, 1943; Swabey, 1946; Lewis & Elvin-Lewis, 1977).

312. Artificial Propagation Considerations (Cultivation): *Guaiaecum officinale* trees are cultivated to a considerable extent in the species' native range and somewhat elsewhere, including the Old World (e.g. Brazil, Argentina, Uruguay; Egypt, Ghana; India, Pakistan): Menninger, 1962; Kunkel, 1978; Ghafoor, 1974; Cowen, 1965; Neal, 1965; cf. Smiley, 1960; Schubert, 1979; Mell, 1924; Seddon & Lennox, 1980; Kingsbury, 1988; Pertchik & Pertchik, 1951; Porter, 1969; Duke, 1986; Adams, 1972; Proctor, 1984; Hoyos, 1976; Stafleu, 1951; Gooding, 1973; Howard, 1988. However, forestry plantings in Puerto Rico were discontinued because of its slow growth (Little & Wadsworth, 1964; cf. Fors, 1936); broader ornamental use may be similarly discouraged. *Guaiaecum sanctum* also is cultivated for amenity, much less frequently than *G. officinale* (e.g. Neal, 1965; Porter, 1969, com. USFWS, 1991; Ward, 1979).

32. Illegal International Trade: The amount of illegal trade is quite speculative. Since July 1975, presumably there has been a significant amount of such *Guaiaecum sanctum* commerce undetected. Individual sales and transport of lignum-vitae from México to USA are heard anecdotally; the species probably is *G. coulteri*, perhaps *G. sanctum*. This commerce may not have been authorized under Mexican law, particularly the new law in effect in 1988; *G. coulteri* was listed as Amenazada [Threatened] in 5/91. Nationally in USA (Florida), larger trees of *G. sanctum* have been illegally cut, and smaller plants removed for ornamental use.

These few examples suggest that there probably is illegal removal from nature reserves and illegal international trade in *Guaiaecum officinale* within the so multinational wider Caribbean region. The CC Parties (see §61.) included this species in SPAW Protocol Annex III because they felt it needed international cooperation.

#### 4. Protection Status

41. National: Probably applicable for such a well-known species as *G. officinale* are general and/or specific logging regulations, as well as general inclusion in some nature reserves (see IUCN, 1982). For example, in Colombia, the species is in

Parque Nacional Natural Isla de Salamanca. On Martinique, the first law for this species was in 1701 (Kimber, 1988); on Martinique and Guadeloupe, the species is legally protected now (J. off. Républ. franç. 3/03/89: 2856-2857). On Puerto Rico, the species occurs in Guánica Commonwealth Forest, and Culebra and Cabo Rojo National Wildlife Refuges. In the Dominican Republic, all timber felling is generally restricted.

42. International: Three countries include populations of other *Guaiaicum* in the Annex to the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere [CNWH] (OEA, 1967; USDS, 1942; Coolidge, 1945, 1949; Orejas-Miranda, 1976):

|             |           |   |
|-------------|-----------|---|
| Costa Rica  | 22/10/65: | <i>G. sanctum</i> [as " <i>G. officinale</i> guayacán" which is not native] |
| El Salvador | 22/10/65: | <i>G. guatemalense</i>  |
| Nicaragua   | 23/04/41: | <i>G. sanctum</i>   |
| USA         | 22/10/65: | <i>G. sanctum</i> [non-official informative list]                           |

*Guaiaicum sanctum* (timber) was included in CITES Appendix II 2/03/73 (effective 1/07/75); see also §516.

43. Additional Protection Needs: The Parties to the Cartagena Convention [CC] (see §61.) in 6/91 included *Guaiaicum officinale* in Annex III of the SPAW Protocol to the CC. SPAW Article 11(1)(c) states in part: "With regard to the species listed in Annex III, each [SPAW] Party shall, in co-operation with other Parties, formulate, adopt and implement plans for the management and use of such species, including: ... (ii) for species of flora, including their parts or products, the regulation of their collection, harvest and commercial trade." The CC Parties agreed at the June 1991 meeting (CEP, 1991) to the principle in Final Act 19(c):

"That the mechanisms specified in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) may be used to govern international trade in wild fauna and flora under Article 11 of the [SPAW] Protocol." Thus, a purpose of this CITES proposal is to adopt that SPAW principle for this species, in order to bring about some of the protection the CC Parties considered to be needed for the species.

## 5. Information on Similar Species

Lignum-vitae wood from *Guaiaicum* spp. is well known and generally readily recognizable (e.g. Walker, 1989; Bramwell, 1976; Linnell & Arnoult *n.d.*; Titmuss, 1965; Bond, 1950; Coleman, 1966). However, international trade data are recorded either as "lignum-vitae" (or less precisely). Usually, the genus can be surmised from the place of export. Some other considerations follow:

51. *Guaiaicum* Not in Appendix II (Porter, 1972; Vail & Rydberg, 1910):

511. *Guaiaicum coulteri* (see map, §21.A): Occurs mostly on the Pacific slope, from NW México southward to Central America (Porter, 1972; Record & Hess, 1943; Standley, 1923; Wiggins, 1964; Mason & Mason, 1987; and Miranda, 1952, 1953). *Guaiaicum coulteri* var. *coulteri* has the range of the species; how far south into Central America it grows is unclear (Porter, 1972, 1963; see also §142.). *Guaiaicum coulteri* var. *palmeri*



- occurs only in NW México, from NW Sonora into N Sinaloa (Wiggins, 1964; Porter, 1963; Standley, 1923).
512. *Guaiacum guatemalense* Planchon ex Rydberg may represent hybrids of *G. coulteri* × *G. sanctum* (Porter, 1972); see §142.
  513. *Guaiacum unijugum*: Endemic to México, in SE Baja California (Wiggins, 1964, 1980; Porter, 1963, 1972).
  514. Generally, the lignum-vitae in commerce is not accompanied by a scientific name to species (*cf.* Bond, 1950; Coleman, 1966; Chudnoff, 1984); seldom, *Guaiacum officinale* is given (*cf.* Constantine, 1959; Titmuss, 1965). However, in the wood trade, "*G. officinale*" does not correspond to a scientific identification, but is a general, ± trade name. For a commercial offering, it is unlikely that *G. sanctum* and highly unlikely that *G. coulteri* would be named (if known) (Cantwell, com. USFWS, 1991), perhaps because the market expects (some prefer) *G. officinale* (*cf.* FPRL, 1956; Record & Hess, 1943; Beekman, 1964).
  515. Yet for areas with several native *Guaiacum* taxa, information on the wood's origin or identification is needed to regulate their populations (*G. sanctum*, *G. guatemalense* and *G. officinale*) (*cf.* FPRL, 1956; Record, 1921a) and/or to evaluate data. For example, writing on Chiapas (in S México), Miranda (1952, 1953) used "*G. sanctum*" in error for *G. coulteri* (Porter, 1972); Font Quer (1958) disseminated the mistake (from Miranda). Currently, some exported "lignum-vitae" originates on México's central west coast (Cantwell, com. USFWS, 1991); therefore, the wood is from *G. coulteri* (*cf.* Record & Hess, 1943; González Ortega, 1934b; Martínez, 1959). Thus, the trade data in §31.A include an unknown amount of this species.
  516. *Guaiacum sanctum* timber has been regulated by CITES since, 1975 (and the species with most parts and derivatives since 1985). Probably some undetected trade has been in the general "lignum-vitae" statistics, or under the generalized use of "*Guaiacum officinale*" in commerce. Listing *G. officinale* may help to bring attention to the origin of lignum-vitae wood exported. Treating *Guaiacum guatemalense* as a synonym of *G. sanctum* would assist in controlling *G. sanctum* trade as well.
52. Other Non-CITES Taxa: An essential oil marketed as guaiac oil or oil of guaiac wood (e.g. used in perfume and soap) is derived from the heartwood of *Bulnesia sarmientoi* (Mabberley, 1989; Bramwell, 1980; Duke, 1983; Record & Hess, 1943; see below). The woods of three other species are marketed indicating their ± similarity to the true lignum-vitae (*Guaiacum*) (Mabberley, 1989; Howes, 1975; FPRL, 1956; Record & Hess, 1943). In Verbenaceae: *Premna lignum-vitae* (Schauer) Pieper (Queensland lignum-vitae), NE Australia. In Zygophyllaceae: *Bulnesia arborea* (Jacquin) Engler (verawood or Maracaibo lignum-vitae), Colombia and Venezuela (Hoyos, 1976; Lasser, 1971); and *Bulnesia sarmientoi* Lorentz ex Grisebach (Paraguay lignum-vitae), Paraguay and Argentina (Tortorelli, 1956; Descole, O'Donnell & Lourteig, 1943). Wood and general keys to *Bulnesia* and *Guaiacum* are in Record (1943) and Hutchinson (1967).

## 6. Comments from Countries of Origin

61. This proposal carries forward a concern expressed by the Parties to an environmental agreement administered by UNEP. Most Governments where *Guaiacum officinale* is native are Parties (see §61.A.) to the Cartagena Convention [CC]: the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region [3/83]. The CC Parties adopted [1/90] a Protocol Concerning Specially Protected Areas and Wildlife [SPAW] to the CC (CEP, 1990a; FUNEP, 1990). One aspect to implement the SPAW Protocol concerns species on three annexes. The CC Parties by 5/90 provisionally nominated taxa for each initial annex; at an 11/90 meeting, a selection was made from those taxa and others nominated then (CEP, 1990b,, 1990c). The CC Parties met 6/91, and adopted the 11/90 recommended lists of taxa, thus creating the initial Annexes I-III (CEP, 1991). With that step, the CC Parties can ratify, accept, approve or accede to, the SPAW Protocol; after nine Parties have done so, it will enter into force.
62. The United States deems this 5-month review process by CITES Parties an opportunity for direct comments and consideration, which it welcomes. [Comments may be sent to the U.S. Scientific Authority (U.S. FWS/OSA, Washington) at telefax 703-358-2276 or -2202, or to the U.S. Management Authority at telefax 703-358-2281.]

## 7. Additional Remarks

*Guaiacum coulteri* is widespread and sometimes has been reported as plentiful (Mason & Mason, 1987; Rzedowski, 1978; Shelford, 1963), and its full range into [western] Central America is unclear (Porter, 1972, com. USFWS, 1991). Probably significant quantities of the "lignum-vitae" in commerce now originate from this species (§515.; cf. Record & Hess, 1943). The distribution, population dynamics, and use of *G. coulteri* require evaluation to see if it may need to be included in CITES Appendix II, under the similar-appearance provision of CITES Article II, paragraph 2(b), to diminish inappropriate export of regulated taxa of *Guaiacum*, or in its own right (see §32.).

The biological nature and distribution of *Guaiacum guatemalense* need further study, to determine whether the supposition (hypothesis) of Porter (1972) is correct, so the trees can be appropriately managed.

## 8. Pertinent References

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56.1A. New World: Parties to CITES, Convention on Nature in Western Hemisphere (CNWH), and/or Cartagena Convention (CC)<sup>1</sup>

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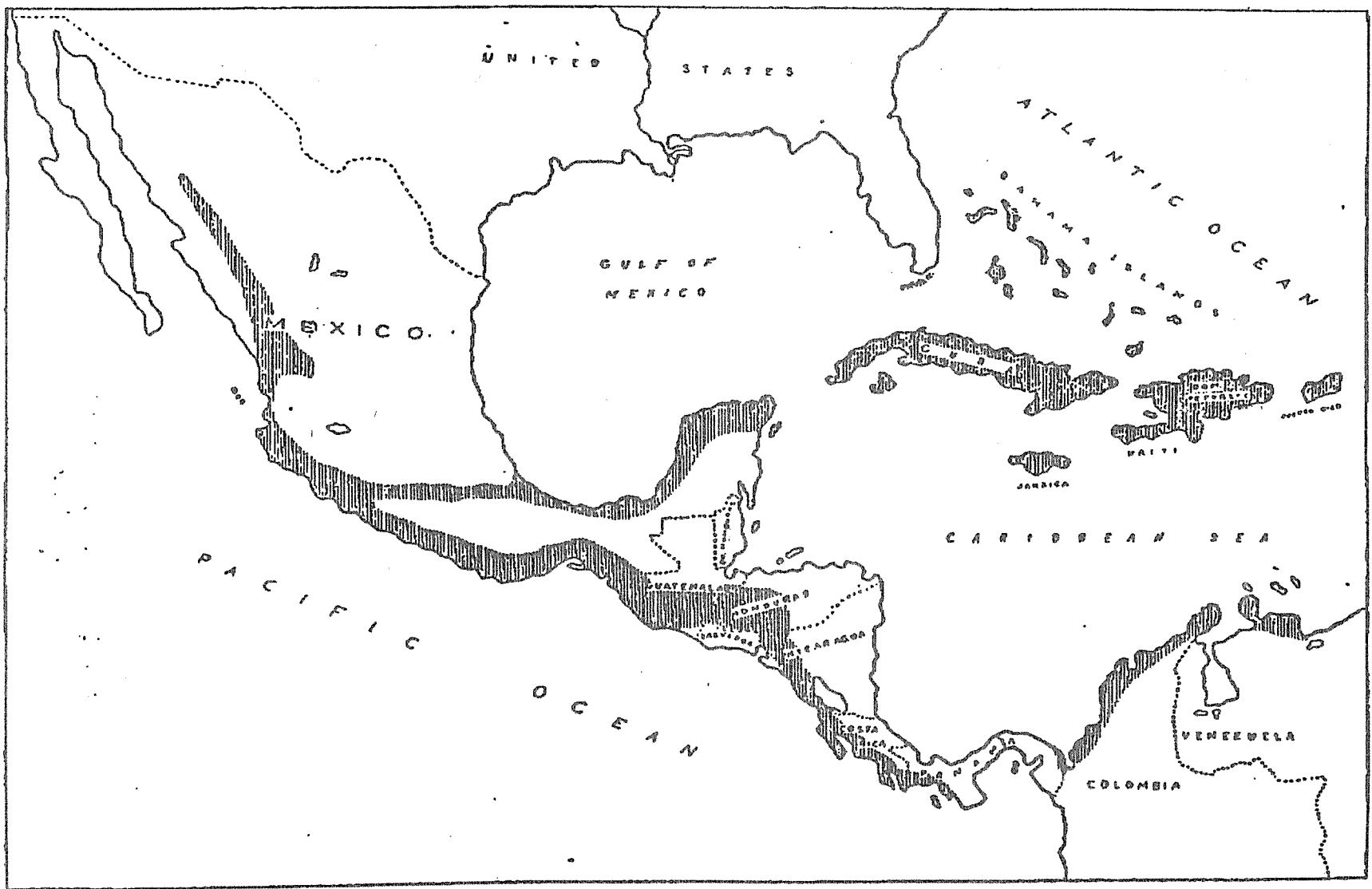
| CITES | CNWH | CC | Party  | [? may not be eligible; - not applicable] |
|-------|------|----|--|---|
|       |      | x  | Antigua and Barbuda  |   |
| x     | x    | -  | Argentina  |   |
| x     |      |    | Bahamas  |   |
|       |      | x  | Barbados   |   |
| x     |      |    | Belize   |   |
| x     |      | -  | Bolivia  |   |
| x     | x    | -  | Brasil   |   |
| x     |      | -  | Canada   |   |
| x     | x    | -  | Chile  |   |
| x     |      | x  | Colombia   |   |
| x     | x    |    | Costa Rica   |   |
| x     |      | x  | Cuba   |   |
| x     | ?    | -  | Denmark: Greenland   |   |
|       |      | x  | Dominica   |   |
| x     | x    |    | Dominican Republic [República Dominicana]  |   |
| x     | x    | -  | Ecuador  |   |
| x     | x    | -  | El Salvador  |   |
| x     | ?    | x  | France: French Guiana (La Guyane française);<br>Guadeloupe [+ St.-Martin, St.-Barthélemy (St. Barts)];<br>Martinique; & [- CC] St.-Pierre et Miquelon          |   |
|       |      | x  | Grenada  |   |
| x     | x    | x  | Guatemala  |   |
| x     |      |    | Guyana   |   |
|       | x    |    | Haiti  |   |
| x     |      |    | Honduras   |   |
|       |      | x  | Jamaica  |   |
|       | x    | x  | México   |   |
| x     | ?    | x  | Netherlands > Aruba; & Netherlands Antilles Federation<br>(N: St. Maarten, Saba, St. Eustatius (Statia);<br>S: Curaçao, Bonaire)                               |   |
| x     | x    |    | Nicaragua  |   |
| x     | x    | x  | Panamá   |   |
| x     |      | -  | Paraguay   |   |
| x     | x    | -  | Perú   |   |
|       |      |    | St. Kitts and Nevis [St. Christopher and Nevis]  |   |
| x     |      | x  | St. Lucia  |   |
| x     |      | x  | St. Vincent and the Grenadines   |   |
| x     |      |    | Suriname   |   |
| x     | x    | x  | Trinidad and Tobago  |   |
| x     | ?    | x* | U.K. > * Bermuda; Turks and Caicos Islands, British Virgin<br>Islands, * Anguilla, * Montserrat, Cayman Islands;<br>& [- CC] Falkland Islands (Islas Malvinas) |   |
| x     | x    | -  | Uruguay  |   |
| x     | x    | x  | U.S.A. < Puerto Rico; U.S. Virgin Islands; ± Navassa Island  |   |
| x     | x    | x  | Venezuela  |   |
| **    | -    |    | Regional economic integration organizations  |   |

\* CC: U.K. > Anguilla, Montserrat not included; Bermuda not eligible  
 \*\* if 1983 amendment of CITES Article XXI enters into force

<sup>1</sup> Only parties to CC have option to become parties to SPAW. CC Parties: 18 nations by 11/90; potentially 28 nations, and qualified regional economic integration organizations. CC Parties 6/91 meeting was first opportunity to ratify SPAW.

§2.1A. General Distribution (from Record & Hess 1943).

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FLORA (1)



Range of Lignum-vitae (Guaiacum spp.)



## EVOLUTION ON TIMBER EXPORTS (SAWN WOOD, VENEER AND LOGS)

p. 9

| SPECIES                                 | 1984           |               | 1985           |               | 1986           |               | 1987           |                | 1988           |                |
|---|----------------|---------------|----------------|---------------|----------------|---------------|----------------|----------------|----------------|----------------|
|   | t              | 1000 US\$ FOB | t              | 1000 US\$ FOB | t              | 1000 US\$ FOB | t              | 1000 US\$ FOB  | t              | 1000 US\$ FOB  |
| <u>VENEER</u>                           |                |               |                |               |                |               |                |                |                |                |
| <u>NÃO CONÍFERAS</u>                    | <u>37.481</u>  | <u>32.669</u> | <u>38.204</u>  | <u>33.987</u> | <u>36.474</u>  | <u>31.396</u> | <u>33.924</u>  | <u>31.998</u>  | <u>41.067</u>  | <u>40.421</u>  |
| Cedro                                   | 433            | 313           | 831            | 625           | 445            | 340           | 420            | 325            | 659            | 546            |
| Imbuia                                  | 1.364          | 2.125         | 658            | 985           | 813            | 1.199         | 1.012          | 2.219          | 1.027          | 2.274          |
| Jacarandá ( Dalbergia nigra and others) | 120            | 1.197         | 84             | 1.023         | 84             | 832           | 55             | 276            | 51             | 418            |
| Virola (Cucuba)                         | 1.124          | 700           | 543            | 186           | 148            | 70            | 1.335          | 467            | 2.563          | 898            |
| Aguano (Mogno) (S. macrophylla)         | 5.297          | 7.544         | 5.335          | 7.644         | 5.056          | 7.295         | 6.791          | 11.633         | 6.499          | 12.472         |
| Carvalho Americano                      | 4.627          | 7.519         | 6.377          | 11.243        | 4.353          | 8.536         | 2.360          | 4.772          | 3.555          | 8.172          |
| Pau Ferro                               | 626            | 1.669         | 423            | 1.309         | 280            | 840           | 313            | 830            | 120            | 411            |
| Cerejeira                               | 133            | 232           | 263            | 348           | 447            | 488           | 475            | 851            | 591            | 845            |
| Jacareúma                               | 245            | 125           | 83             | 92            | 8              | 10            | -              | -              | -              | -              |
| Louro                                   | 112            | 284           | 102            | 227           | 66             | 132           | 191            | 388            | 71             | 309            |
| Muiratunga                              | 1.868          | 509           | 1.748          | 479           | 1.539          | 441           | 743            | 264            | 1.473          | 419            |
| Outros                                  | 21.482         | 9.652         | 21.757         | 9.826         | 23.235         | 10.943        | 20.229         | 10.243         | 24.322         | 13.657         |
| <u>LOGS</u>                             |                |               |                |               |                |               |                |                |                |                |
| <u>NÃO CONÍFERAS</u>                    |                |               |                |               |                |               | <u>7.377</u>   | <u>1.089</u>   | <u>258.958</u> | <u>6.987</u>   |
| Cedro                                   | -              | -             | -              | -             | -              | -             | -              | -              | 4              | 1              |
| Frasijé                                 | -              | -             | -              | -             | -              | -             | -              | -              | 180            | 9              |
| Ipe                                     | -              | -             | -              | -             | -              | -             | -              | -              | 360            | 32             |
| Louro                                   | -              | -             | -              | -             | -              | -             | 49             | 4              | 1.134          | 159            |
| Mecacamba                               | -              | -             | -              | -             | -              | -             | -              | -              | 334            | 43             |
| Guiri                                   | -              | -             | -              | -             | -              | -             | 2.512          | 364            | 3.167          | 654            |
| Outra                                   | -              | -             | -              | -             | -              | -             | 4.816          | 622            | 253.839        | 6.089          |
| <b>TOTAL</b>                            | <b>115.948</b> | <b>58.400</b> | <b>155.324</b> | <b>71.108</b> | <b>201.041</b> | <b>88.434</b> | <b>275.542</b> | <b>137.767</b> | <b>598.318</b> | <b>165.077</b> |

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## EVOLUTION ON TIMBER EXPORT (SAWN WOOD)

| SPECIES<br>SAWN WOOD                              | 1984          |                  | 1985           |                  | 1986           |                  | 1987           |                  | 1988           |                  |
|---|---------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
|   | t             | 1000<br>US\$ FOB | t              | 1000<br>US\$ FOB | t              | 1000<br>US\$ FOB | t              | 1000<br>US\$ FOB | t              | 1000<br>US\$ FOB |
| <u>CONÍFERAS</u>                                  | <u>402</u>    | <u>105</u>       | <u>123</u>     | <u>23</u>        | <u>13</u>      | <u>5</u>         | <u>2.121</u>   | <u>350</u>       | <u>28.957</u>  | <u>4.249</u>     |
| Outras  | 402           | 105              | 123            | 23               | 13             | 5                | 2.121          | 350              | 28.957         | 4.249            |
| <u>NÃO CONÍFERAS</u>                              | <u>78.065</u> | <u>25.626</u>    | <u>116.697</u> | <u>37.09E</u>    | <u>164.554</u> | <u>57.033</u>    | <u>232.120</u> | <u>104.330</u>   | <u>269.326</u> | <u>113.420</u>   |
| Andiroba  | -             | -                | -              | -                | -              | -                | 9.187          | 1.923            | 11.473         | 2.559            |
| Cedro   | 2.841         | 900              | 1.694          | 57E              | 3.304          | 1.007            | 2.437          | 1.033            | 3.772          | 1.494            |
| Imbuia  | 3.192         | 1.759            | 841            | 362              | 2.354          | 898              | 3.493          | 1.830            | 2.628          | 1.563            |
| Jacarandá ( <u>Dalbergia nigra</u> and<br>others) | 265           | 151              | 313            | 169              | 455            | 213              | 302            | 278              | 358            | 528              |
| Sucupira  | 4.011         | 771              | 5.103          | 882              | 4.638          | 829              | 7.497          | 1.731            | 7.304          | 1.676            |
| Virola  | 17.919        | 3.903            | 17.752         | 3.739            | 28.867         | 6.583            | 28.890         | 8.750            | 38.403         | 7.554            |
| Aguano (Mogno) ( <u>S. macrophylla</u> )          | 27.697        | 13.088           | 61.323         | 25.004           | 80.945         | 37.115           | 124.088        | 76.201           | 117.017        | 74.008           |
| Assacú  | 497           | 32               | 99             | 10               | 47             | 8                | 50             | 31               | 18             | 3                |
| Cedrorana   | 111           | 11               | 515            | 113              | 574            | 142              | 956            | 328              | 2.475          | 798              |
| Freijó  | 519           | 123              | 576            | 159              | 560            | 145              | 397            | 136              | 421            | 129              |
| Ipê (pau d'arco)                                  | 869           | 167              | 1.045          | 223              | 4.556          | 962              | 2.124          | 604              | 3.550          | 878              |
| Quaruba (Caferana)                                | 1.219         | 161              | 471            | 53               | 171            | 42               | 809            | 152              | 759            | 123              |
| Peroba  | 87            | 22               | 105            | 35               | 33             | 12               | -              | -                | 77             | 39               |
| Angelim Vermelho                                  | -             | -                | -              | -                | -              | -                | 1.967          | 380              | 5.428          | 1.088            |
| Cerejeira   | -             | -                | -              | -                | -              | -                | 1.785          | 610              | 3.549          | 960              |
| Jatobá  | -             | -                | -              | -                | -              | -                | 6.890          | 1.644            | 27.158         | 6.758            |
| Guatambu  | -             | -                | -              | -                | -              | -                | 589            | 210              | 1.459          | 528              |
| Tatajuba  | -             | -                | -              | -                | -              | -                | 597            | 120              | 4.101          | 980              |

SAWN WOOD EXPORT DATA - 1988/1989

| SPECIES  | 1988           |            |                |             | 1989           |             |                |             |
|--|----------------|------------|----------------|-------------|----------------|-------------|----------------|-------------|
|  | t              | %          | 1000 US\$ FOB  | %           | t              | %           | 1000 US\$ FOB  | %           |
| <u>CONÍFERAS</u>                               | <u>46.763</u>  | <u>15</u>  | <u>16.076</u>  | <u>12,4</u> | <u>60.773</u>  | <u>15,2</u> | <u>24.303</u>  | <u>16,4</u> |
| Pinho  | 17.806         | 5,7        | 11.827         | 9,1         | 14.291         | 3,8         | 9.431          | 6,4         |
| Outros   | 28.957         | 9,3        | 4.249          | 3,3         | 46.482         | 12,4        | 14.872         | 10,0        |
| <u>NÃO CONÍFERAS</u>                           | <u>269.326</u> | <u>85</u>  | <u>113.420</u> | <u>87,6</u> | <u>314.650</u> | <u>83,8</u> | <u>123.835</u> | <u>83,6</u> |
| Cedro  | 3.772          | 1,2        | 1.494          | 1,2         | 2.883          | 0,8         | 1.080          | 0,7         |
| Imbuia   | 2.828          | 0,9        | 1.563          | 1,2         | 7.642          | 2,0         | 3.877          | 2,6         |
| Jacarandá ( <u>Dalbergia nigra</u> and others) | 358            | 0,1        | 528            | 0,4         | 330            | 0,1         | 400            | 0,3         |
| Sucupira                                       | 7.304          | 2,3        | 1.676          | 1,3         | 4.278          | 1,1         | 846            | 0,6         |
| Virola   | 38.403         | 12,1       | 7.554          | 5,8         | 27.733         | 7,4         | 4.816          | 3,3         |
| Mogno - Aguano ( <u>S. macrophylla</u> )       | 117.017        | 37,0       | 74.008         | 57,2        | 88.412         | 23,6        | 52.753         | 34,3        |
| Assacú   | 18             | -          | 3              | -           | -              | -           | -              | -           |
| Cedrorama                                      | 2.475          | 0,6        | 798            | 0,6         | 3.909          | 1,0         | 1.167          | 0,8         |
| Freijó   | 421            | 0,1        | 129            | 0,1         | 140            | -           | 74             | -           |
| Ipê  | 3.550          | 1,1        | 878            | 0,7         | 5.755          | 1,5         | 1.672          | 1,1         |
| Quaruba  | 759            | 0,2        | 123            | 0,1         | -              | -           | -              | -           |
| Peroba   | 77             | -          | 39             | -           | -              | -           | -              | -           |
| Andiroba                                       | 11.473         | 3,6        | 2.559          | 2,0         | 6.998          | 1,9         | 1.320          | 0,9         |
| Angelim Vermelho                               | 5.428          | 1,7        | 1.088          | 0,8         | 7.484          | 2,0         | 1.673          | 1,1         |
| Cerejeira                                      | 3.549          | 1,1        | 960            | 0,7         | 507            | 0,1         | 190            | 0,1         |
| Guatambu                                       | 1.459          | 0,5        | 529            | 0,4         | -              | -           | -              | -           |
| Jatobá   | 27.458         | 8,7        | 6.758          | 5,2         | 30.444         | 8,1         | 7.853          | 5,3         |
| Tatejuba                                       | 4.101          | 1,3        | 980            | 0,8         | 5.871          | 1,6         | 1.221          | 0,8         |
| Guiri  | -              | -          | -              | -           | 2.455          | 0,7         | 1.575          | 1,1         |
| Outros   | 38.876         | 12,3       | 11.754         | 9,1         | 119.809        | 31,9        | 45.258         | 30,6        |
| <b>Total</b>                                   | <b>316.089</b> | <b>100</b> | <b>129.495</b> | <b>100</b>  | <b>375.423</b> | <b>100</b>  | <b>148.138</b> | <b>100</b>  |

Fonte: CACEX / B. BRASIL

Elaboração: IBA-IA/DIREN/DECOM

VEENEER EXPORT DATA - 1988/1989

| SPECIES  | 1988          |            |                  |            | 1989          |             |                  |             |
|--|---------------|------------|------------------|------------|---------------|-------------|------------------|-------------|
|  | t             | %          | 1000<br>US\$ FOB | %          | t             | %           | 1000<br>US\$ FOB | %           |
| <u>CONÍFERAS</u>                                 | <u>821</u>    | <u>2</u>   | <u>430</u>       | <u>1</u>   | <u>3.578</u>  | <u>9,8</u>  | <u>2.325</u>     | <u>7,2</u>  |
| Pinho  | 821           | 2          | 430              | 1          | 459           | 1,3         | 197              | 0,6         |
| Outros   | -             | -          | -                | -          | 3.119         | 8,5         | 2.128            | 6,6         |
| <u>NÃO CONÍFERAS</u>                             | <u>41.067</u> | <u>98</u>  | <u>40.421</u>    | <u>99</u>  | <u>33.091</u> | <u>90,2</u> | <u>29.870</u>    | <u>92,8</u> |
| Jedro  | 699           | 1,5        | 546              | 1          | 236           | 0,6         | 166              | 0,5         |
| Imbuia   | 1.027         | 2,4        | 2.274            | 6          | 680           | 1,8         | 1.569            | 4,9         |
| Jacarandá ( <u>Dalbergia nigra</u> , and others) | 51            | -          | 418              | 1          | 46            | 0,1         | 268              | 0,8         |
| Virvira  | 2.563         | 6          | 898              | 2          | 654           | 1,8         | 196              | 0,6         |
| Mogro - Aguano ( <u>S. macrophylla</u> )         | 6.495         | 15         | 12.472           | 31         | 4.069         | 11,1        | 6.802            | 21,1        |
| Carvalho Americano                               | 3.555         | 9          | 8.172            | 20         | 2.476         | 6,8         | 6.495            | 20,3        |
| Pau Ferro  | 120           | 0,3        | 411              | 1          | -             | -           | -                | -           |
| Cerejeira  | 591           | 1,4        | 845              | 2          | 219           | 0,6         | 282              | 0,8         |
| Louro  | 171           | 0,4        | 309              | 1          | 103           | 0,3         | 168              | 0,5         |
| Mulratinga                                       | 1.473         | 4          | 419              | 1          | 2.437         | 6,7         | 589              | 1,8         |
| Sucupira   | -             | -          | -                | -          | 4             | -           | 3                | -           |
| Jatobá - Jutaf                                   | -             | -          | -                | -          | 9             | -           | 5                | -           |
| Fam-marfim                                       | -             | -          | -                | -          | 6             | -           | 4                | -           |
| Outros   | 24.322        | 58         | 13.657           | 33         | 22.152        | 60,4        | 13.323           | 41,4        |
| <b>Total</b>                                     | <b>41.888</b> | <b>100</b> | <b>40.851</b>    | <b>100</b> | <b>36.669</b> | <b>100</b>  | <b>32.195</b>    | <b>100</b>  |

Fonte: CACEX / B. BRASIL

Elaboração: IBAMA/DIREN, DECOM