# ANALYSIS OF TRADE IN PARTS AND DERIVATIVES OF *GUAIACUM* SPECIES FROM MEXICO

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## 1. Introduction

The genus *Guaiacum* consists of six species, several of which are of uncertain taxonomic status. The whole genus has been included in Appendix II of CITES since 2003 following a decision taken at the 12th Conference of the Parties (COP) to the Convention in November 2002. Several species were listed prior to the generic listing with *Guaiacum sanctum* included in Appendix II of CITES in 1975 and *Guaiacum officinale* included in 1992. The species which occur in Mexico are *Guaiacum angustifolium, G. coulteri, G. guatemalense* (uncertain taxonomic status), *G.sanctum* and *G. unijugum*. The Mexican species with products reported in international trade are *G. coulteri* and *G. sanctum.* Following a decision taken at the 12th CITES COP, the current annotation for *Guaiacum* spp. as listed in Appendix II of the Convention is:

> Annotation #2 Designates all parts and derivatives, except: a) seeds and pollen; b) seedling or tissue cultures obtained in vitro, in solid or liquid media, transported in sterile containers; c) cut flowers of artificially propagated plants; and d) chemical derivatives and finished pharmaceutical products.

This means that CITES trade controls are required for all parts and derivatives of plants of the genus with the exception of the parts and products specified above. When *G. sanctum* was first included in Appendix II only timber was designated for control. This was changed following a decision in 1985 and, until 2003, all parts and derivatives were subject to control with the exception of *a) seeds and pollen; b) seedling or tissue cultures obtained in vitro, in solid or liquid media, transported in sterile containers; cut flowers of artificially propagated plants*

This paper analyses the parts and derivatives of the Mexican species which are currently in trade as a contribution to the CITES Project S-231 undertaken by the IUCN/SSC Medicinal Plant Specialist Group.

The main objectives of the study are to:

- Confirm which parts/derivatives/commodities enter international trade
- Identify the main purpose and use of these
- Review the current trade volume and estimate the relative proportion in trade of the different parts/derivatives/products

The activities undertaken as part of the study included a literature survey, internet search, analysis of the CITES trade data, and correspondence with experts. The people contacted as part of the study are listed in Annex 1.

## 2. Utilisation

Trees of the genus *Guaiacum* produce a hardwood known as lignum vitae which is one of the heaviest woods currently in trade. It has a self-lubricating quality that makes it useful for mechanical purposes and it is currently used as the raw material for marine propeller shafts, pulley sheaves, bearings, casters and bowling balls. The timber of *G.offinicale* and *G.sanctum* has been traded for centuries and remains a valuable commodity. Logging of large trees of *G. coulteri* also took place during the last century to supply commercially valuable timber, to the extent that a recovering population now remains largely composed of small individuals (Gordon & al., 2005). The species is now exploited for local use as firewood and as a speciality wood for handicrafts. Flowers and resin from *G. coulteri* have been used in the past as colouring agents. The wood *G. unijugum* is also used locally in Mexico.

In addition to producing valuable timber, *Guaiacum* species have useful medicinal properties as reflected in the common name of lignum vitae. The whole heartwood and isolated resin is used in medicine, with *G. officinale* and *G. sanctum* used in similar ways (Conway, 2001). The resin which makes up 25 percent of the heartwood dry weight can be extracted by heating logs with a hole in one end, by boiling wood chips or mixing sawdust with alcohol or ether (Record and Hess, 1943 as cited in Grow and Schwartzman, 2001). The medicinal uses of *G. sanctum* recorded by Grow and Schwartzman (2001) include the use as a laxative, an antidote for poison, to improve the appetite, as a remedy for gonorrhea, syphilis, coughs, tuberculosis and to treat gout and rheumatism. *G. coulteri* has been used as an expectorant, blood purifier, mild laxative and to treat rheumatoid arthritis. The berries of *G.coulteri* have been traditionally used as medicine (Conway, 2001). *G. angustifolium* is also considered a medicinal plant with root extracts used to treat rheumatism and syphilis. There is very limited systematically gathered information currently available on the medicinal uses of *Guaiacum* in Mexico (Alvarez-Romero, in litt. 2004). A study looking at the status of wild populations of *G. sanctum* and *G. coulteri* is currently underway in Mexico coordinated by CONABIO and this may yield relevant information on the uses.

The products of *Guaiacum* advertised in trade, for example on the internet and company brochures, include wood, bark, resin powder, fluid extract and tinctures. *Guaiacum* is also an ingredient in various medicinal products such as "celery complex" and "Rheumatic Pain" (Blank & al., 2000). The medicinal products of *Guaiacum* are generally by-products of the timber trade (Grow and Schwartzman, 2001). It has been reported that the medicinal market for *Guaiacum* is nearly non-existent (Blank & al., 2000).

3. International Trade

The export of *Guaiacum sanctum* from Mexico as recorded in the UNEP-WCMC CITES Trade Database is given in Table 1 below. As can be seen from the table all reported trade is in timber rather than in medicinal products. The main importing countries in terms of volume (in declining order) are Germany, China, Japan and Hong Kong (SAR).

Re-exports are recorded in the UNEP-WCMC CITES Trade Database of one carving from the UK to the US in 1999 and 20kg carvings from France to Switzerland in 2001. In both cases country of origin is recorded as unknown. Re-export of 1 $m^3$ sawnwood from US to Canada, country of origin Mexico is recorded in 2001 and, in 2002, two re-export transactions of 15,030 $cm^3$ sawn wood and 11 $m^3$ sawnwood are recorded, again from US to Canada, country of origin Mexico. Export of one log of *G. sanctum* from the US to Japan is recorded for 2000. Export from Germany to Mexico of 17.799 $m^3$ of timber of *G.sanctum* is also recorded in 2000.

As the listing of *G. coulteri* did not come into effect until 2003, very limited trade in this species has been reported to CITES. Only one transaction has been recorded in the UNEP-WCMC CITES Trade Database. This was the export of 4560 kg of sawnwood from Germany to Brazil, with the country of origin given as Mexico (Caldwell, pers. comm.). In 2002, one non-specific export of 30 kg of timber of *Guaiacum* spp was recorded from Mexico to the US.

The total list of terms reported in the CITES Trade database for *Guaiacum* is: carvings, derivatives, dried plants, flowers, live, logs, leaves, sawn wood, specimens, stems, timber pieces, unspecified. The derivatives were 150 pieces re-exported by Japan to Korea in 1985 with the country of origin given as Mexico (Caldwell, pers. comm.).

**Table 1:** Mexican exports of *Guaiacum sanctum,* 1998-2002, as recorded in the UNEP-WCMC CITES Trade Database

| Country of Import | 1998 | 1999 | 2000 | 2001 | 2002 | Average |
|---|---|---|---|---|---|---|
| | $m^3$ | $m^3$ | $m^3$ | $m^3$ | $m^3$ | $m^3$ |
| Canada | 0.576 | | | | | |
| China | 16.000 | 26.000 | 57.000 | 70.290 | 91.520 | 52.162 |
| Germany | 62.831 | 69.679 | 57.825 | 51.151 | 92.980 | 66.893 |
| Greece | | 2.500 | | | | |
| Hong Kong | 35.000 | 54.000 | 20.000 | | | 21.800 |
| Indonesia | | 4.166 | | | | |
| Japan | 19.154 (4.100) | 13.362 (5.900) | 150.446 | 24.990 | 36.960 | 48.982 |
| Thailand | | 0.345 | | | | |
| Turkey | 0.630 | | | | | |
| UK | | | 8.500 | | | |
| US | 19.400 | 1.000* sawn wood 1.1941 | 3.319 | 2.280 | 10.610 | 7.361 |

Notes:
1. The products reported in trade are all recorded as "timber" unless "sawn wood" is noted in the table.
2. The quantities are all as reported by Mexico except where marked * which indicates that the quantity is reported by the importing country or where a different value is reported by the importing country and is given in brackets.

It has been noted that trade data do not usually distinguish between *Guaiacum* spp. traded as timber from Mexico and that exports from the west coast of Mexico are likely to have been *G. coulteri*. This species has apparently been exported to North America and Europe for medicinal use for centuries (Government of Germany, 2002).

Germany annually imports about 50 tons of *G. coulteri* for industrial hardwood applications. In addition up to 40 tons of heartwood resin and wood chips are imported as aromatic substances for use in the liqueur industry (Barsch, et al 2002).

*G. coulteri* is also imported to the US to be used in diagnostic kits for detecting hidden gastrointestinal bleeding. Resin of the heartwood of *G. coulteri* is used in the kits. It is uncertain whether the resin is processed in the US or imported in this form from Mexico. Some of the kits are re-exported to Germany (Barsch, & al., 2002).

4. Analysis and discussion

1. Guaiacum species are used in the timber, medicinal and food (liqueur) sector.

2. It would appear from the CITES trade data that all recent international trade in parts and derivatives of *Guaiacum* spp. is in "timber" or "sawn wood".

3. During this short study verification of the nature of the international trade in *Guaiacum* medicinal products has proved to be very difficult. It remains unclear where the processing of medicinal products takes place and which commodities constitute the international trade beyond timber.

4. It has been suggested that the regulation of commodities such as oils and resins should be considered as there is apparently some demand for these in international market and they are at present excluded from CITES controls (Alvarez-Romero, in litt. 2004). Further information on the form in which *Guaiacum* is exported from Mexico, as may be provided by the current study

taking place on *G. sanctum* and *G. coulteri,* would be beneficial as would additional information collected by importing countries.

5. References


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**Personal communications**


Jorge G. Alvarez-Romero, email to Sara Oldfield, November 2004

John Caldwell, personal communication to Sara Oldfield, October 2004


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**People contacted for information**

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