

## **The Trade and Use of Agarwood in Taiwan, Province of China\***



**Report compiled by**

**TRAFFIC East Asia-Taipei and TRAFFIC Southeast Asia**

**For the CITES Secretariat**

# **TRAFFIC**

**\* The term 'Taiwan' throughout this report, refers to Taiwan, Province of China**



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## EXECUTIVE SUMMARY

Agarwood is taken from trees of the genera *Aquilaria* and *Gyrinops*. It has been widely utilized for religious and medicinal purposes in Chinese societies for over a thousand years. Religiously, pure agarwood materials and agarwood products are burnt as incense or made into sculptures, beads and essential oil; medicinally, agarwood is often ground into powder or small particles for crude or prepared medicine and utilized to increase “qi” circulation inside bodies from the view of the Traditional Chinese Medicine. Traditionally, medicinal agarwood is known as Ch’en Hsiang (or Ch’en Xiang) in Chinese, and refers to the oleoresin found in *Aquilaria* trees of a certain type (most likely *Aquilaria crassna*) and maturity. There is also a new trend developing of utilizing or collecting high-quality agarwood and agarwood products as a hobby. Because of the unique process of formation of agarwood, it often takes quite a length of time for agarwood to develop in the wild. The high market value of agarwood provides great incentive to the trade, and the trade is gradually posing threat to the population of *Aquilaria* spp. in the wild. Thus, it is important to understand the latest trend of agarwood trade and trade behaviours internationally as well as domestically in major agarwood trade countries.

In TRAFFIC’s earlier report *Heart of the Matter: Agarwood Use and Trade and CITES Implementation for Aquilaria malaccensis*, Taiwan is listed as one of the countries that have been most active in agarwood trade. This study tackles the current status of agarwood trade in Taiwan<sup>1</sup> through analyzing official trade data kept by the Customs as well as by conducting a market survey on agarwood traders.

Although not being a Party to CITES, Taiwan implements CITES regulations through its domestic legislation. The international trade of agarwood in Taiwan is regulated by the Foreign Trade Act. The import and export of agarwood to/from Taiwan is classified into three Taiwan’s Standard Classification of Commodities (C.C.C.) codes for the Customs regulation: Ch’en Hsiang (medicinal agarwood), Garoowood wood in the rough (agarwood log), Garoowood, wood sawn or chipped lengthwise (agarwood timber). The majority of agarwood was imported to Taiwan under the category of Ch’en Hsiang (medicinal agarwood) for both medicinal and non-medicinal purposes. The continuing availability of this Ch’en Hsiang quality is increasingly uncertain, and some medicinal traders believe that it is doubtful whether much of the agarwood described or categorized as Ch’en Hsiang is of such a high quality. The main sources of all agarwood imported to Taiwan are Indonesia (70.69%), Vietnam (18.24%), Thailand (6.35%) and Malaysia (3.06%) over the period 1999 to 2003. The annual import volume was directly affected by, and fluctuated in accordance with, the domestic economic conditions in Taiwan. The export market is relatively small in comparison with the import market; the largest export destination by volume and frequency is Hong Kong.

There are no clear grading and pricing standards for agarwood and agarwood products in the Taiwanese consumer market. Agarwood traders in Taiwan often play multiple roles in the chain of trade from import to retail and export, and they either work directly with traders in countries of origin or with traders of re-exporting States, such as Singapore. The traders of agarwood for medicinal and non-medicinal purposes can generally be separated into two distinctive groups in Taiwan. In general, consumers in Taiwan have neither adequate knowledge on agarwood nor the access to relevant information; while traders have limited understanding on the status of overall international agarwood trade and the status of wild populations of agarwood-producing species. However, consumer preferences have changed from high-grade to low-grade agarwood products in response to the general economic downturn and the change of socio-economic structure in Taiwan

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<sup>1</sup> The designation Taiwan, used throughout the report, refers to Taiwan, Province of China.

over the past five years. It is not known to what extent this trend corresponds to decreasing availability of high-grade agarwood on the global market, but as mentioned above, there are concerns over the validity of some products categorized as Ch'en Hsiang.

A large number of traders surveyed remarked upon high degrees of fluctuation in quantity, quality and pricing of agarwood in the international market, particularly the past five years. The traders also foresee much rigorous restriction on agarwood trade internationally in the near future. However, they also pointed out the difficulties in enforcement under the current regulation structure because of limited capacity of enforcement officers on distinguishing between genuine and fake agarwood, and between products derived from the CITES Appendix II-listed *Aquilaria malaccensis* and agarwood-producing species.

There are also a number of business entities experimenting with artificial propagation of agarwood-producing species in Taiwan. Nevertheless, the progress and success of inducing resin production is yet to be evaluated.

In order to gain even more comprehensive knowledge on overall agarwood trade in Taiwan for the reference of future regulation and management, it is recommended to pull together the missing pieces of the whole picture of agarwood trade records, for example the respective amount of agarwood imported for medicinal and non-medicinal purposes, information on agarwood carried in by individual passengers, sales records of TCM products containing agarwood etc. It is also proposed that further education efforts should be devoted to assisting traders in Taiwan in understanding the current status of *Aquilaria* spp. as well as its trade internationally.

## **PURPOSE OF THE STUDY**

The purpose of this study is to describe the nature and significance of the consumer market for agarwood in Taiwan (Province of China), in response to CITES Decision 12.71, and to report these findings to the CITES Plants Committee and the CITES Secretariat.

## **METHODOLOGY**

### Definition of terminology

#### *Agarwood*

In this report the term agarwood is used to describe the aromatic wood derived from all agarwood-producing species. Ch'en Hsiang, however, is traditionally defined as having specific qualities, the most important being the fact that it sinks in water (because of the density of its resin content). Differing degrees of buoyancy allow for distinction between pieces of Ch'en Hsiang. According to an experienced agarwood trader, real Ch'en Hsiang can be distinguished by seven main criteria: i) each piece is unique in shape, because of the rarity of such high quality; ii) there should be observable strips of both oleoresin and lignum; iii) Ch'en Hsiang is dense and will sink in water, even in powdered form; iv) Ch'en Hsiang does not have noticeable fragrance before it is burned, and when it burns it exudes a bright flame and black smoke; v) there are three 'colours' of Ch'en Hsiang resin, green, yellow and black, with green being the most prized for its 'warmer' medical effect and superior fragrance' vi) the nature of Ch'en Hsiang is acrid and bitter; vii) the highest quality Ch'en Hsiang is believed to be sourced from Viet Nam, and known as *ky nam* or *kanam*, and has an additional characteristic in that the oleoresin is glutinous compared to other Ch'en Hsiang, in which the resin deposits are solid (Chim-Hyang Corporation, *in litt.* to TRAFFIC Southeast Asia, 2004). However, as noted below, Ch'en Hsiang has been used in Taiwan to define medicinal agarwood under Taiwan's Customs Classification (see below).

### *Agarwood for import / export*

According to Taiwan's Customs Classification of Import and Export Commodities (Anon., 1998), there are three categories of agarwood items in the reported trade data (further specified in the later section). In this report the official titles of these three categories will be replaced by:

- Medicinal agarwood: replacing "Ch'en Hsiang"
- Agarwood logs: replacing "Garowood (i.e. gaharu wood), wood in the rough"
- Agarwood timber: replacing "Garowood (i.e. gaharu wood), wood sawn or chipped lengthwise"

### *Agarwood in consumer market*

- i. Agarwood raw materials: In the report, the following items are available in the consumer market:
  - Chips: agarwood raw materials that range from to the size of a finger to smaller than the size of a hand.
  - Pieces: agarwood raw materials from about the size of a hand to any possible larger size.
  - Raw Powder: pure agarwood powder ground from agarwood pieces or chips.
  - Oil: essential oil extracted from agarwood.
- ii. Agarwood products: In the report, the following items are available in the consumer market:
  - Agarwood incense: There are different shapes of incense which are purely made of agarwood raw powder held together by natural adhesives or made from a mixture of agarwood and other Traditional Chinese Medicine (TCM) powder. Incense takes form of incense sticks (standing and lying), incense coils, incense cones etc.
  - Agarwood sculpture: sculptures made of agarwood, mainly for religious purpose by Buddhists and art collections.
  - Agarwood beads: beads made of carved agarwood pieces, mainly for religious purpose by Buddhists. They are usually strung into two different types of products: wristlet and rosary (108 beads).
  - Agarwood liquor: liquor contains agarwood as an ingredient. The liquor products are taken for leisure rather than for medicinal purpose.
  - Other agarwood products include: tea bags, capsules, soap, name seals etc.

### *Type of agarwood-related business*

- Importer: indicates company or store that imports agarwood from outside Taiwan through the Customs checkpoints or by carry-in.
- Raw materials processor: indicates factory that grinds agarwood pieces or chips into powder.
- Manufacturer: indicates factory that produce agarwood products as listed above.
- Wholesaler: includes wholesaler and middle dealers of all different levels, between importer and retailer.
- Retailer: indicates store that deals with consumers directly.
- Exporter: indicates company that exports agarwood raw materials or products to out side of Taiwan.
- Traders: generally applies to all business involved in agarwood trade.

### *Currency*

The main currencies used in this report are Taiwan Dollar (TWD) and US Dollar (USD). The exchange rate for the period of this market survey in this report is based on the average rate from April 5 to May 6, 2004 according to the on-line currency converter [www.oanda.com](http://www.oanda.com) at TWD1 = USD0.03027.

### Collection of background information

The first main element of this study is a series collection of background information. The baseline reference of this study is previous TRAFFIC reports (Barden *et al*, 2000; Song, 2002). Official agarwood trade data, importers/exporters database, relevant regulations and database of licensed TCM products containing agarwood were collected from Taiwan's Customs, the Bureau of Foreign Trade (BOFT) and the Committee on Chinese Medicine and Pharmacy (CCMP) under the Department of Health. Some market information and contacts for agarwood traders were collected from the Internet and through contacts from previous TRAFFIC projects.

### Market surveys

The second main element of this study is based on a series of market surveys, focusing on agarwood importers listed on the importers database of Taiwan External Trade Development Council (TAITRA) (Anon. 2003a) and several others traders (importers and retailers) found via Internet search, from TRAFFIC's previous research contacts or by recommendation of traders visited. TAITRA is Taiwan's largest non-profit import and export trade promoter initially established by the Government, and the database mentioned above is accessible from its website, [www.taiwantrade.com.tw](http://www.taiwantrade.com.tw). Additional interviews with government officials (two individuals) and artificial propagator (one individual) were conducted (see Table 1).

**Table 1: Telephone interview conducted to government officials and specialists**

Identity		No. of Person(s) Interviewed	Total
Government Officials	Directorate General of Customs	1	2
	CCMP*	1	
Artificial Propagator		1	1

\*CCMP: Committee on Chinese Medicine and Pharmacy under the Department of Health, Taiwan

The survey was conducted from the 5<sup>th</sup> of April to the 6<sup>th</sup> of May 2004 and both by site visit and by telephone. Site visits were carried out in three areas of Taiwan where most of agarwood importers are located: Taipei (north), Kaohsiung and Tainan (south). A total of 16 traders were visited. Telephone surveys with traders focusing on import of agarwood elicited feedback from six traders (see Table 2).

**Table 2: Number of agarwood traders surveyed in market survey, April-May 2004**

Site Visit	Location	Taipei	Kaohsiung	Tainan	-	-	Total	Grand Total
	No. of Traders	7	8	1			16	
Telephone Survey	Location	Taoyuan	Taichung	Changhua	Chiayi	Korea	Total	
	No. of Traders	1	2	1	2	1	7	

Depending on the nature of traders surveyed, the surveyor used two different identities alternatively during the survey: academic researcher on agarwood market (mostly towards TCM agarwood traders) and potential retailer seeking supplies of agarwood (mostly towards incense traders). In general, traders are very cautious about giving out information to a researcher and are more open to a potential business partner. As a result, the TCM business in Taiwan has its own unique community

and it is somewhat problematic to conduct surveys as an outsider to this business circle. The total sample size of the survey is 23 traders, one individual conducting artificial propagation in Taiwan, and two government officials.

## **TRADE REGULATION AND MANAGEMENT OF AGARWOOD IN TAIWAN**

### **Regulation**

The legal foundation of agarwood trade regulation in Taiwan is based on Article 11 of the Foreign Trade Act (promulgated on February 5, 1993) (Anon. 2003b):

*Export/import of goods shall be liberalized provided, however, that restriction thereof may be imposed by reason of the requirements of international treaty, trade agreement, national defence, social security, culture, hygiene, and environmental/ecologic protection, or policy. Nomenclatures of goods subject to export/import restriction under the preceding paragraph and regulations governing export/import of such goods shall be announced in public by the competent authority after consulting with government agencies concerned.*

The BOFT made an official announcement in 1998 regarding regulation on the international trade of CITES plant species to and from Taiwan. In 2000, the regulation expanded to apply to all CITES Appendix I and II species. The BOFT also updates the listing of regulated species according to the resolutions of each CITES Conference of the Parties (COP).

### ***Responsible Authorities***

Based on Article 11 of the Foreign Trade Act, BOFT functions as a management authority for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Taiwan (although not a Party to CITES). The BOFT is in charge of issuing CITES import and export permits for the CITES Appendix I and II species and maintaining data on the international trade of these species in Taiwan.

The Directorate General of Customs is in charge of carrying out Customs Import Tariff & Classification, inspecting and maintaining monthly and annual data of import and export of all commodities to / from Taiwan. All official import and export of agarwood to/from Taiwan can be found in their monthly and annual publications of statistics of imports / exports.

The Committee on Chinese Medicine and Pharmacy (CCMP) under the Department of Health is the government authority supervising TCM use in Taiwan. It provides guidelines and sets standards for TCM practitioners and industry, issues licences for manufacture of prepared TCM products and maintains databases of traditional and licensed prescriptions and licensed manufacturers. All official information regarding the use of agarwood in TCM is recorded in its databases.

### ***Import /export commodity classification and management of agarwood***

The Customs in Taiwan adopts the Standard Classification of Commodities of the Republic of China (C.C.C.), compiled by the Directorate General of Budget, Accounting & Statistics. The system has been in force since January 1, 1989 for monitoring all imports and exports to/from Taiwan. The C.C.C. codes are constructed on the basis of the Harmonized Commodity Description and Coding System (HS) which had been published by the Customs Cooperation Council and served as a framework for the combined volume of *Customs Import Tariff and Classification of*

*Import and Export Commodities* in Taiwan. In a complete C.C.C. code, it contains 10 digits (Heading, Subheading, Division and Item) and a check digit (Anon., 1998).

There are three C.C.C. codes in the classification system for agarwood items. The detailed description and respective tariff rate is shown in Table 3:

**Table 3: Import and export classification and tariff for agarwood in Taiwan**

CCC Code	Section & Chapter	Description of Goods	Tariff Rate	CR	IR
1211-90-12-00-0	Section II. Vegetable Products Chapter 12. Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	Ch'en Hsiang (Lignum Aquilariae) [As "medicinal agarwood" in the report]	Free	R	513
4003-99-11-00-4	Section IX. Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork Chapter 44. Wood and articles of wood; wood charcoal	Garowood wood in the rough, whether or not stripped of bark or sapwood, or roughly squared [As "agarwood log" in the report]	Free	R	
4407-99-11-00-0	(same as above)	Garowood, wood sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or finger-jointed, of a thickness exceeding 6 mm [As "agarwood timber" in the report]	Free	R	

Source: Compiled from *Customs Import Tariff and Classification of Import and Export Commodities of the ROC, June 1998 Revised Edition*, Directorate General of Customs, MOF and the Board of Foreign Trade, MOEA

**CR:** Customs requirement; **IR:** Import regulations; **R:** Non duty drawback

**513:** (1) Importation of *Chinese raw medicine* [raw traditional Chinese medicine] shall comply with the regulation of "502". (2) Importation of commodity not to be used as *Chinese medicine* shall be exempted from complying with the regulation of "502", but a clear indication that the commodity is "not to be used as Chinese medicine" is required.

**502:** For importing dry goods: (1) a photocopy of business licence for dealing with *Chinese raw medicine* (or pharmaceutical manufacturing licence issued by the Department of Health, Executive Yuan) is required. (2) Commodity description shall indicate *Chinese raw medicine* and the specific name in Chinese. The above regulations do not apply to importing non-dry goods.

Ch'en Hsiang (Lignum Aquilariae 1211-90-12-00-0) is classified under the chapter for medicinal plants. Importers should hold a TCM trading licence. However, commodities can also be imported with indication "not to be used as Chinese medicine" without such licence by company or individuals (Directorate General of Customs, pers. comm. to TRAFFIC East Asia-Taipei, April 2004). Thus, the import / export data of Ch'en Hsiang (Lignum Aquilariae 1211-90-12-00, replaced by the term "medicinal agarwood" in the text of the report) found in the following section should not directly equate to the quantity of agarwood imported to Taiwan for medicinal use. Items imported under this code are mainly woodchips or wood pieces roughly less than 10 kg per piece which can be held in one hand (Directorate General of Customs, pers. comm. to TRAFFIC East Asia-Taipei, April 2004). Items imported under "agarwood timber" (4407-99-11-00) code are usually wood pieces or chunks from approximately 10 kg and above per piece to anything smaller than a log, many in various natural shapes. Although commodities of all three codes for agarwood are tax-free (see Table 3), the majority of importers prefer to import agarwood, even larger pieces, as medicinal agarwood (Directorate General of Customs, pers. comm. to TRAFFIC East Asia-Taipei, April 2004).

## RESULTS AND DISCUSSIONS - OFFICIAL IMPORT / EXPORT DATA

### *Import of CITES-listed agarwood, Aquilaria malaccensis, to Taiwan*

There is currently only one agarwood-producing species, *A. malaccensis*, listed on CITES Appendix II. Taiwan's imports and exports of this species is regulated and supervised by BOFT, which maintains a database of import/export records of *A. malaccensis* to/from Taiwan. The data in Table 4, provided by BOFT, shows that the two main source countries for agarwood derived from *A. malaccensis* are Indonesia and Malaysia, while also indicating that Singapore plays a significant role as a re-exporting State. According to the declared country of origin, the amount of agarwood derived from *A. malaccensis* that originated from Malaysia is approximately twice as much as that from Indonesia. Total imports of *A. malaccensis* decreased by more than 50% from 2001 to 2002, and by over 30% from 2002 to 2003. No export (re-export) records of *A. malaccensis* are available from Taiwan.

**Table 4: Agarwood from *Aquilaria malaccensis* imported to Taiwan 2001-2003, by quantity (Unit: kg)**

Origin	Export Country	2001	2002	2003	Total	%	
Malaysia	Malaysia	11 344	9 500	0	20 844		51.9%
Indonesia	Indonesia	3 956	1 590	0	5 546	13.8%	24.9%
	Singapore	3 489	165	795	4 449	11.1%	
Not Specified	Singapore	9 041	285	0	9 326		23.2%
	<b>Total</b>	<b>27 830</b>	<b>11 540</b>	<b>795</b>	<b>40 165</b>		<b>100%</b>

No data available for 1999 and no imports in 2000

Source: compiled from data provided by BOFT

Reports of exports and re-exports to Taiwan, according to data held in the UNEP-WCMC CITES trade database, show that over 519 t of *A. malaccensis* have been traded to Taiwan in the period 1995-2002. Taiwan, as a non-CITES Party, is not required to submit annual reports and therefore no import data is available from the UNEP-WCMC CITES trade database. However, while the BOFT indicated there were no imports of *A. malaccensis* into Taiwan in 2000, there was just over 6 t reported as exported or re-exported to Taiwan in that calendar year.

### *Import of agarwood derived from all agarwood-producing species into Taiwan*

While BOFT oversees the imports and exports of *Aquilaria malaccensis* to/from Taiwan, Customs maintains a database of import/export records of all agarwood-producing species to/from Taiwan. The following analyses are based on the import/export records in the databases from 1999-2003 (Anon. 2004a).

#### *Medicinal agarwood*

According to the Customs data, the import volume of medicinal agarwood from 1999 to 2003 shows a decreasing trend in annual import volume from 735 tonnes in 1999 to 320 tonnes in 2002, followed by a subsequent increase to 560 tonnes in 2003 (see Table 5 and Figure 1). The top three countries of medicinal agarwood imported from 1999-2003 are Indonesia (65.19%), Vietnam (22.62%) and Thailand (7.98%). Notably, in addition to the more familiar countries of origin and transit, Australia was also listed as an export country in 1999.

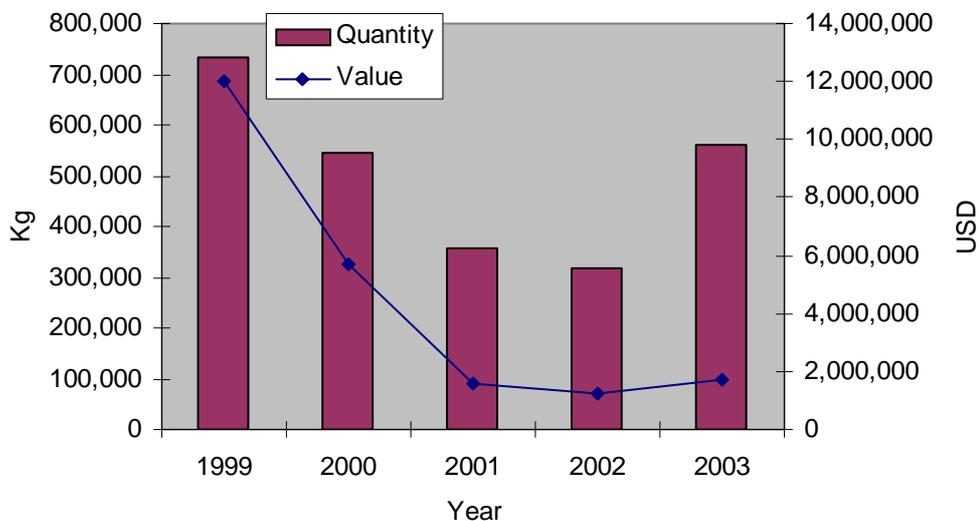
**Table 5: Import of medicinal agarwood (12119012000) to Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg; Value-USD)

Country	1999	2000	2001	2002	2003	Total	%
Australia	3 089 (896)	0	0	0	0	3 089 (896)	0.12% (<0.01%)
HK	360 (61 216)	0	0	0	0	360 (61 216)	0.01% (0.27%)
India	0	14 525 (4 375)	0	250 (3 425)	0	14 775 (7 800)	0.59% (0.03%)
Indonesia	477 663 (1 618 434)	341 440 (1 665 769)	250 467 (1 272 836)	247 704 (1 056 717)	322 640 (1 525 037)	1 639 914 (7 138 793)	65.19% (32.09%)
Laos	0	14 865 (7 769)	0	0	0	14 865 (7 769)	0.59% (0.03%)
China	370 (3 176)	0	0	0	18 (58)	388 (3 234)	0.02% (0.02%)
Malaysia	1 070 (12 972)	14 078 (88 574)	22 930 (66 892)	10 258 (23 024)	10 402 (99 756)	58 738 (291 218)	2.34% (1.31%)
Myanmar	0	3 801 (559)	0	0	0	3 801 (559)	0.15% (<0.01%)
Singapore	4 033 (50 087)	2 600 (21 003)	1 548 (8 174)	1 676 (6 075)	0	9 857 (85 339)	0.39% (0.38%)
Thailand	26 831 (7 670)	54 255 (18 889)	20 755 (94 626)	27 510 (13 335)	71 425 (20 558)	200 776 (155 078)	7.98% (0.70%)
Vietnam	221 082 (10 253 902)	99 755 (3 891 338)	61 298 (123 984)	31 840 (153 450)	155 090 (74 157)	569 065 (14 496 831)	22.62% (65.16%)
<b>TOTAL</b>	<b>734 498</b> <b>(12 008 353)</b>	<b>545 319</b> <b>(5 698 276)</b>	<b>356 998</b> <b>(1 566 512)</b>	<b>319 238</b> <b>(1 256 026)</b>	<b>559 575</b> <b>(1 719 566)</b>	<b>2 515 628</b> <b>(22 248 733)</b>	<b>100%</b> <b>(100%)</b>
<b>Average Value/kg</b>	<b>16</b>	<b>10</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>9</b>	

Source: Directorate General of Customs of Taiwan

**Figure 1: Medicinal agarwood imported to Taiwan 1999-2003**



## Agarwood logs

Import volumes of agarwood logs dropped sharply in 2001 (less than 30% of the amount in 2000), followed by a trend of rapid increase in 2002 and 2003. Consistently, the major suppliers of agarwood logs to Taiwan over the five-year period 1999-2003 have been Indonesia (87.12) and Vietnam (6.65%) (see Table 6 and Figure 2). In regards of the average value per kilogramme, there was a sharp decrease from 2001 onwards (from USD100-200/kg to less than USD10/kg).

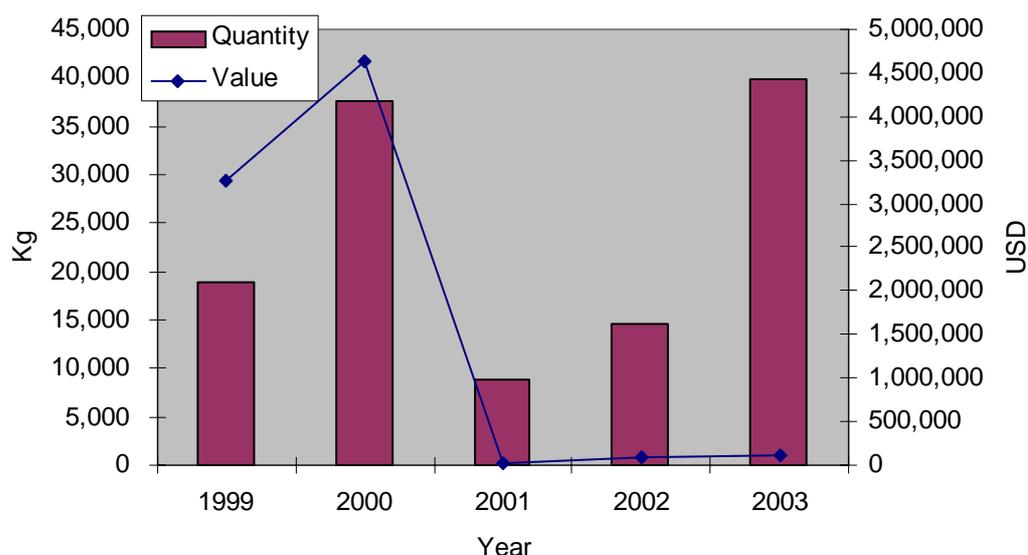
**Table 6: Import of agarwood logs (44039911004) to Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg, Value-USD)

Country	1999	2000	2001	2002	2003	Total	%
<b>Indonesia</b>	17 367 (3 264 556)	30 331 (3 167 574)	6 563 (18 077)	12 944 (72 878)	37 022 (92 487)	<b>104 227</b> <b>(6 615 572)</b>	<b>87.12%</b> <b>(81.37%)</b>
<b>Laos</b>	0	0	0	260 (1 712)	360 (2 391)	<b>620</b> <b>(4 103)</b>	<b>0.52%</b> <b>(0.05%)</b>
<b>Malaysia</b>	0	5 490 (1 462 762)	919 (2 736)	0	0	<b>6 409</b> <b>(1 465 498)</b>	<b>5.36%</b> <b>(18.02%)</b>
<b>Singapore</b>	176 (2 051)	0	69 (3 176)	181 (1 998)	0	<b>426</b> <b>(7 225)</b>	<b>0.35%</b> <b>(0.09%)</b>
<b>Vietnam</b>	1 309 (9 061)	1 762 (10 066)	1 219 (4 517)	1 270 (4 312)	2 400 (10 131)	<b>7 960</b> <b>(38 087)</b>	<b>6.65%</b> <b>(0.47%)</b>
<b>TOTAL</b>	<b>18 852</b> <b>(3 275 668)</b>	<b>37 583</b> <b>(4 640 402)</b>	<b>8 770</b> <b>(28 506)</b>	<b>14 655</b> <b>(80 900)</b>	<b>39 782</b> <b>(105 009)</b>	<b>119 642</b> <b>(8 130 485)</b>	<b>100%</b> <b>(100%)</b>
<b>Average Value/kg</b>	<b>174</b>	<b>123</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>68</b>	

Source: Directorate General of Customs of Taiwan

**Figure 2. Agarwood logs imported to Taiwan 1999-2003**



## Agarwood timber

In contrast to agarwood log import volumes, agarwood timber imports increased gradually from 1999 to peak in 2001, followed by an almost 90% decrease in 2002. However, the fluctuation of the average value per kilogramme was similar to agarwood logs, changing from USD25-50/kg in 1999-2000 to less than USD10 in 2001-2003 with a lowest point in 2001 at USD1/kg (see Table 7 and Figure 3).

Over the period 1999-2003, the major source countries for agarwood timber are Indonesia (93.22%) and Malaysia (6.02%), and from 2001 onwards, these two countries were the only sources recorded. Anomalously, Israel was listed as one of the sources of supply for 2 123 kg of agarwood timber to Taiwan in 1999.

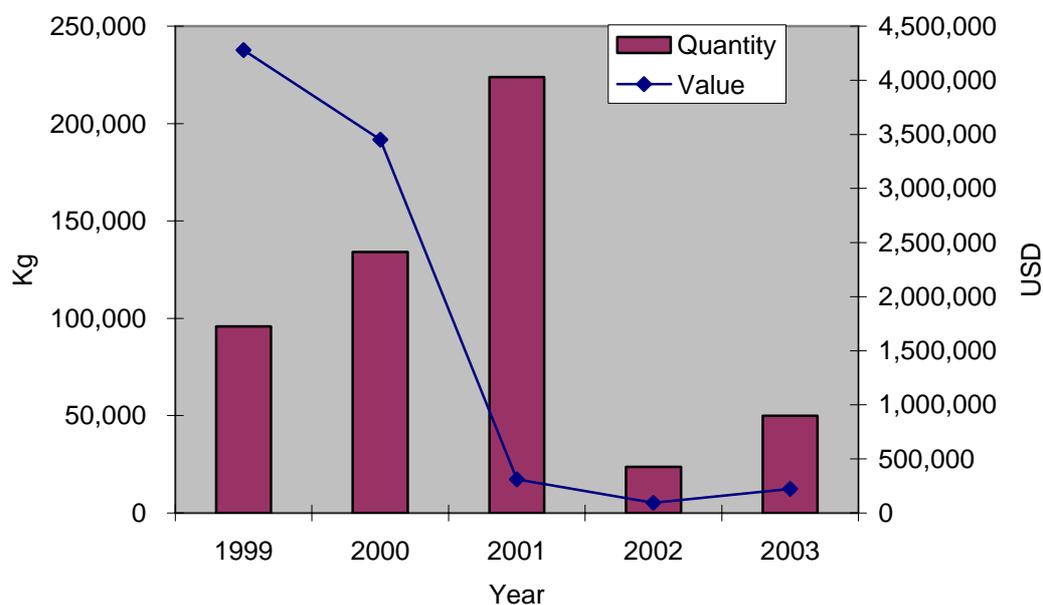
**Table 7: Import of agarwood timber (44079911000) to Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg, Value-USD)

Country	1999	2000	2001	2002	2003	Total	%
<b>Indonesia</b>	93 729 (4 267 812)	128 669 (3 446 169)	200 955 (263 172)	23 204 (94 500)	44 914 (203 256)	<b>491 471</b> <b>(8 274 909)</b>	<b>93.22%</b> <b>(98.94%)</b>
<b>Israel</b>	2 123 (12 519)	0	0	0	0	<b>2 123</b> <b>(12 519)</b>	<b>0.40%</b> <b>(0.15%)</b>
<b>China</b>	0	1 907 (1 926)	0	0	0	<b>1 907</b> <b>(1 926)</b>	<b>0.36%</b> <b>(0.02%)</b>
<b>Malaysia</b>	0	3 428 (3 540)	22 814 (49 421)	470 (1 056)	5 000 (20 306)	<b>31 712</b> <b>(74 323)</b>	<b>6.02%</b> <b>(0.89%)</b>
<b>TOTAL</b>	<b>95 852</b> <b>(4 280 331)</b>	<b>134 004</b> <b>(3 451 635)</b>	<b>223 769</b> <b>(312 593)</b>	<b>23 674</b> <b>(95 556)</b>	<b>49 914</b> <b>(223 562)</b>	<b>527 213</b> <b>(8 363 677)</b>	<b>100%</b> <b>(100%)</b>
<b>Average Value/kg</b>	<b>45</b>	<b>26</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>16</b>	

Source: Directorate General of Customs of Taiwan

**Figure 3. Agarwood timber imported to Taiwan 1999-2003**



### Agarwood across all three categories

Agarwood imports to Taiwan under all three categories show a general trend of gradual decline from 849 tonnes to 357 tonnes from 1999-2002, followed by an upsurge to 649 tonnes in 2003. The total declared monetary values followed a similar trend. The top four source countries from 1999-2003 were: Indonesia (70.69%), Vietnam (18.24%), Thailand (6.35%) and Malaysia (3.06%), with all four countries providing continuous year-on-year supply to Taiwan (see Table 8 and Figure 4).

The top three countries in terms of economic value of agarwood imports over the same period were Indonesia (57.2%), Vietnam (37.40%) and Malaysia (4.65%). Comparing the two major sources, agarwood imported from Indonesia is nearly four times of that from Vietnam in quantity, yet only 1.5 times in value. The value of agarwood per kilogramme from Vietnam is about 2.5 times of that from Indonesia (see Table 8).

The averaged declared value per kilogramme from 1999-2003 were divided into two periods, trending from higher value in 1999-2000 to a lower value from 2001-2003 (see Table 9). In addition, Figure5 shows clearly that the value per kilogramme of agarwood log outshone all other categories during the “high period” but the differences between three categories during the “low period” were comparatively minor.

Apart from the extremely high-value agarwood imported from Hong Kong to Taiwan under the medicinal agarwood category in 1999, agarwood from Vietnam has the highest average value per kilogramme (USD25/kg) of all categories among all regular source countries, followed by Malaysia (USD19/kg) and Indonesia (USD10/kg)(see Table 9).

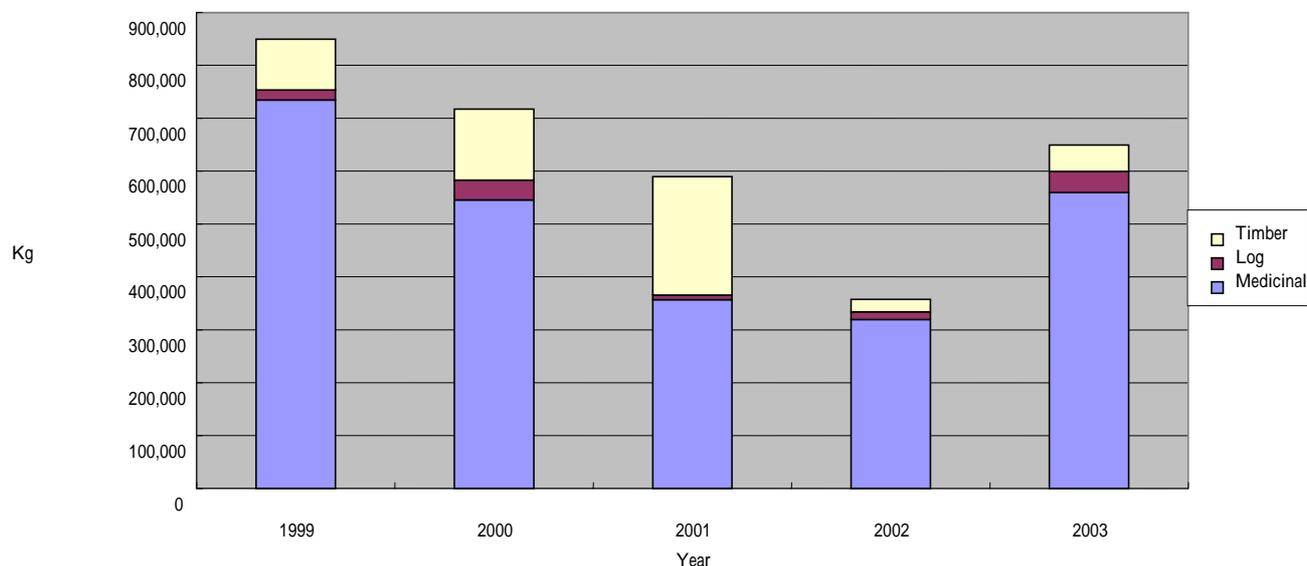
**Table 8: Overall agarwood items imported to Taiwan 1999-2003 by quantity and declared value (in brackets)**

**(Unit: Quantity-kg, Value-USD)**

Country	1999	2000	2001	2002	2003	Total	%
Australia	3 089 (896)	0	0	0	0	3 089 (896)	0.10% (<0.01%)
HK	360 (6 126)	0	0	0	0	360 (61 216)	0.01% (0.16%)
India	0	14 525 (4 375)	0	250 (3 425)	0	14 775 (7 800)	0.47% (0.02%)
Indonesia	588 759 (9 150 802)	500 440 (8 279 512)	457 985 (1 554 085)	283 852 (1 224 095)	404 576 (1 820 780)	2 235 612 (22 029 274)	70.69% (56.86%)
Israel	2 123 (12 519)	0	0	0	0	2 123 (12 519)	0.07% (0.03%)
Laos	0	14 865 (7 769)	0	260 (1 712)	360 (2 391)	15 485 (11 872)	0.49% (0.03%)
China	370 (3 176)	1 907 (1 926)	0	0	18 (58)	2 295 (5 160)	0.07% (0.01%)
Malaysia	1 070 (12 972)	22 996 (1 554 876)	46 663 (119 049)	10 728 (24 080)	15 402 (120 062)	96 859 (1 831 039)	3.06% (4.72%)
Myanmar	0	3 801 (559)	0	0	0	3 801 (559)	0.12% (<0.01%)
Singapore	4 209 (52 138)	2 600 (21 003)	1 617 (11 350)	1 857 (8 073)	0	10 283 (92 564)	0.33% (0.24%)
Thailand	26 831 (7 670)	54 255 (18 889)	20 755 (94 626)	27 510 (13 335)	71 425 (20 558)	200 776 (155 078)	6.35% (0.40%)
Vietnam	222 391 (10 262 963)	101 517 (3 901 404)	62 517 (128 501)	33 110 (157 762)	157 490 (84 288)	577 025 (14 534 918)	18.24% (37.52%)
<b>TOTAL</b>	<b>849 202</b> <b>(19 564 352)</b>	<b>716 906</b> <b>(13 790 313)</b>	<b>589 537</b> <b>(1 907 611)</b>	<b>357 567</b> <b>(1 432 482)</b>	<b>649 271</b> <b>(2 048 137)</b>	<b>3 162 483</b> <b>(38 742 895)</b>	<b>100%</b> <b>(100%)</b>
Average Value/kg	23	19	3	4	3	12	

Source: Directorate General of Customs of Taiwan

**Figure 4: Agarwood imports to Taiwan (1999-2003) by quantity and product type**



**Table 9: Value per kg declared to Customs of agarwood items imported to Taiwan 1999-2003, by country**

(Unit: USD/ kg)

	1999	2000	2001	2002	2003	Total	%
<b>Australia</b>	0.3	0	0	0	0	0.3	<0.01%
<b>Hong Kong</b>	170	0	0	0	0	170	0.16%
<b>India</b>	0	0.3	0	14	0	0.5	0.02%
<b>Indonesia</b>	16	17	3	4	5	10	57.02%
<b>Israel</b>	6	0	0	0	0	6	0.03%
<b>Laos</b>	0	0.5	0	7	7	0.8	0.03%
<b>China</b>	9	1	0	0	3	2	0.01%
<b>Malaysia</b>	12	68	3	2	8	19	4.65%
<b>Myanmar</b>	0	0.1	0	0	0	0.1	<0.01%
<b>Singapore</b>	12	8	7	4	0	9	0.24%
<b>Thailand</b>	0.3	0.4	5	0.5	0.3	0.8	0.43%
<b>Vietnam</b>	46	38	2	5	0.5	25	37.40%
<b>Average</b>	<b>23</b>	<b>19</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>12</b>	

Source: Directorate General of Customs of Taiwan

**Figure 5. Value per Kilogram of Agarwood Imported to Taiwan 1999-2003**

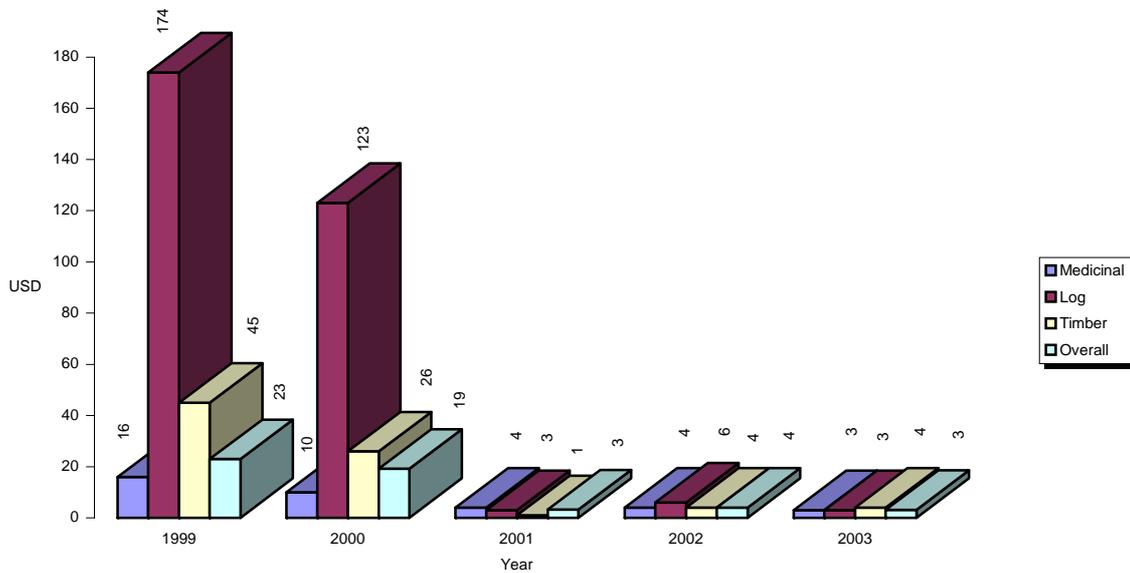


Table 10 and Figure 6 demonstrate the import amounts of agarwood (across all three categories) to Taiwan over a 10-year period from 1994-2003. Over these 10 years, Indonesia, Malaysia, Thailand and Vietnam provided uninterrupted supply to Taiwan, and several countries appear as single-year anomalies for supplying agarwood [Canada, Israel, Myanmar, Pakistan, South Africa and “oth Australa” (*i.e.* other Australasian countries)]. If the decade is broken into two five-year periods (1994-1998 and 1999-2003), two periods show very similar total volumes, with the total volume decreasing by 14% from the first period (3681 tonnes) to the second period (3162 tonnes). Several countries disappeared from the list of supplying counties in the second period: Cambodia, Canada, Pakistan, South Africa, USA and “oth Australa” – with the most significant departure being Cambodia, which was the source of over 311 tonnes from 1994-98. The average annual import amount over the 10-year period was approximately 684 tonnes.

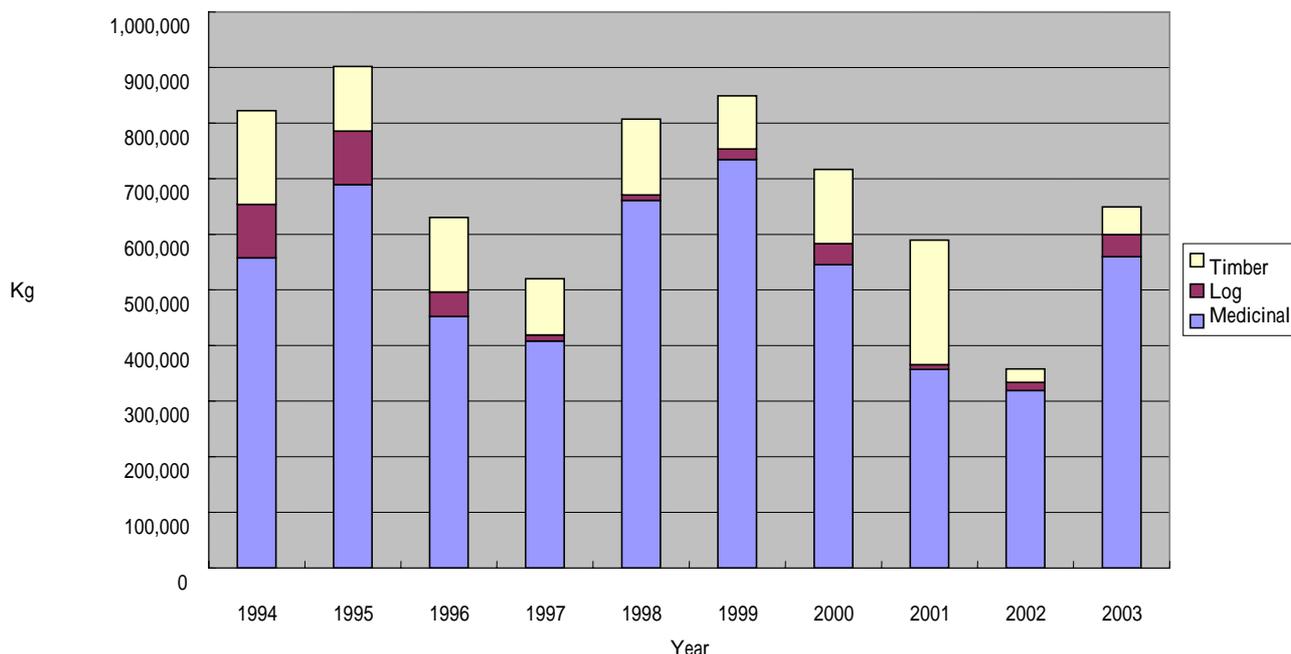
**Table 10: Agarwood import across all three categories to Taiwan 1994-2003, by quantity****(Unit: kg)**

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
<b>Australia</b>	0	100	0	0	0	3 089	0	0	0	0	3 189
<b>Cambodia</b>	54 737	133 819	73 512	35 953	13 244	0	0	0	0	0	311 265
<b>Canada</b>	0	0	0	0	10 504	0	0	0	0	0	10 504
<b>HK</b>	60	0	0	37	0	360	0	0	0	0	457
<b>India</b>	21 074	27 500	1 908	6 279	545	0	14 525	0	250	0	72 081
<b>Indonesia</b>	491 190	482 874	336 946	302 032	555 229	588 759	500 440	457 985	283 852	404 576	4 403 883
<b>Israel</b>	0	0	0	0	0	2 123	0	0	0	0	2 123
<b>Laos</b>	1 850	0	0	0	0	0	14 865	0	260	360	17 335
<b>China</b>	15 454	4 009	7 507	5 272	3 371	370	1 907	0	0	18	37 908
<b>Malaysia</b>	35 451	28 287	44 041	21 275	18 543	1 070	22 996	46 663	10 728	15 402	244 456
<b>Myanmar</b>	0	0	0	0	0	0	3 801	0	0	0	3 801
<b>Pakistan</b>	0	0	203	0	0	0	0	0	0	0	203
<b>Singapore</b>	34 276	46 179	8 063	9 442	3 067	4 209	2 600	1 617	1 857	0	111 310
<b>South Africa</b>	0	7 540	0	0	0	0	0	0	0	0	7 540
<b>Thailand</b>	83 124	68 342	67 028	42 680	65 570	26 831	54 255	20 755	27 510	71 425	527 520
<b>USA</b>	100	6	9	461	250	0	0	0	0	0	826
<b>Vietnam</b>	84 779	103 068	91 129	96 427	136 685	222 391	101 517	62 517	33 110	157 490	1 089 113
<b>oth Australa*</b>	190	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	822 285	901 724	630 346	519 858	807 008	849 202	716 906	589 537	357 567	649 271	6 843 514

\* oth Australa: other Australasian countries

Source: Directorate General of Customs of Taiwan

**Fig. 6: Agarwood Imports to Taiwan 1994-2003 by quantity and category**



**Re-export of agarwood (all *Aquilaria spp.*) from Taiwan**

In the past five years, Taiwan has re-exported agarwood in all three categories, with the most common destination being Hong Kong (see Tables 11, 12, 13 and 14).

**Table 11: Export of medicinal agarwood from Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg, Value-USD)

	1999	2000	2001	2002	2003	Total	%	USD / kg
<b>Hong Kong</b>	69 806 (6 524 884)	33 782 (3 550 231)	0	4 266 (15 457)	0	107 854 (10 090 572)	90.04% (93.85%)	94
<b>Japan</b>	0	0	100 (983)	0	0	100 (983)	<0.01% (0.01%)	61
<b>Malaysia</b>	14 (2 556)	0	0	33 (429)	0	47 (2 985)	<0.01% (0.03%)	64
<b>Singapore</b>	10 194 (643 072)	0	0	476 (12 339)	64 (118)	10 734 (655 529)	8.96% (6.10%)	1
<b>USA</b>	0	0	0	1 056 (1 288)	0	1 056 (1 288)	0.88% (0.01%)	10
<b>Total</b>	<b>80 014</b> <b>(7 107 512)</b>	<b>33 782</b> <b>(3 550 231)</b>	<b>100</b> <b>(983)</b>	<b>5 831</b> <b>(29 513)</b>	<b>64</b> <b>(118)</b>	<b>119 791</b> <b>(10 751 357)</b>	<b>100%</b> <b>(100%)</b>	<b>90</b>

Source: Directorate General of Customs of Taiwan

Hong Kong was the sole destination of agarwood log and timber re-exports from Taiwan. There was no re-export of agarwood logs in 2001-2003 and no export of agarwood timber in 2002-2003. There is no consistent year-on-year supply to any importing State for agarwood of any categories exported from Taiwan over the period of 1999-2003.

**Table 12: Export of agarwood log from Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg, Value-USD)

	1999	2000	2001	2002	2003	Total	USD / kg
<b>Hong Kong</b>	4 773 (53 176)	25 382 (76 763)	0	0	0	30 155 (129 939)	4

Source: Directorate General of Customs of Taiwan

**Table 13: Export of agarwood timber from Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg, Value-USD)

	1999	2000	2001	2002	2003	Total	USD / kg
<b>Hong Kong</b>	13 150 (43 933)	20 003 (171 216)	2 517 (36 574)	0	0	35 670 (251 723)	7

Source: Directorate General of Customs of Taiwan

**Table 14: Export of overall agarwood items from Taiwan 1999-2003 by quantity and declared value (in brackets)**

(Unit: Quantity-kg, Value-USD)

	1999	2000	2001	2002	2003	Total
<b>Hong Kong</b>	87 729 (6 621 993)	79 167 (3 798 210)	2 517 (36 574)	4 266 (15 457)	0	173 679 (10 472 234)
<b>Japan</b>	0	0	100	0	0	100 (983)
<b>Malaysia</b>	14 (2556)	0	0	33 (429)	0	47 (2985)
<b>Singapore</b>	10 194 (643 072)	0	0	476 (12 339)	64 (118)	10 734 (655 529)
<b>USA</b>	0	0	0	1 056 (1288)	0	1 056 (1 288)
<b>Total</b>	<b>7 937</b> <b>(7 267 621)</b>	<b>79 167</b> <b>(3 798 210)</b>	<b>2 617</b> <b>(37 862)</b>	<b>5 831</b> <b>(29 513)</b>	<b>64</b> <b>(118)</b>	<b>185 616</b> <b>(11 133 019)</b>

Source: Directorate General of Customs of Taiwan

Comparing the overall volumes of agarwood import and re-export to/from Taiwan in 1999-2003 (see Table 15), the volume of re-exported agarwood represents less than 2% of imported agarwood each year, except for 2000, when it jumps to 11%. A total of 5.9% of agarwood imports was re-exported over this five-year period.

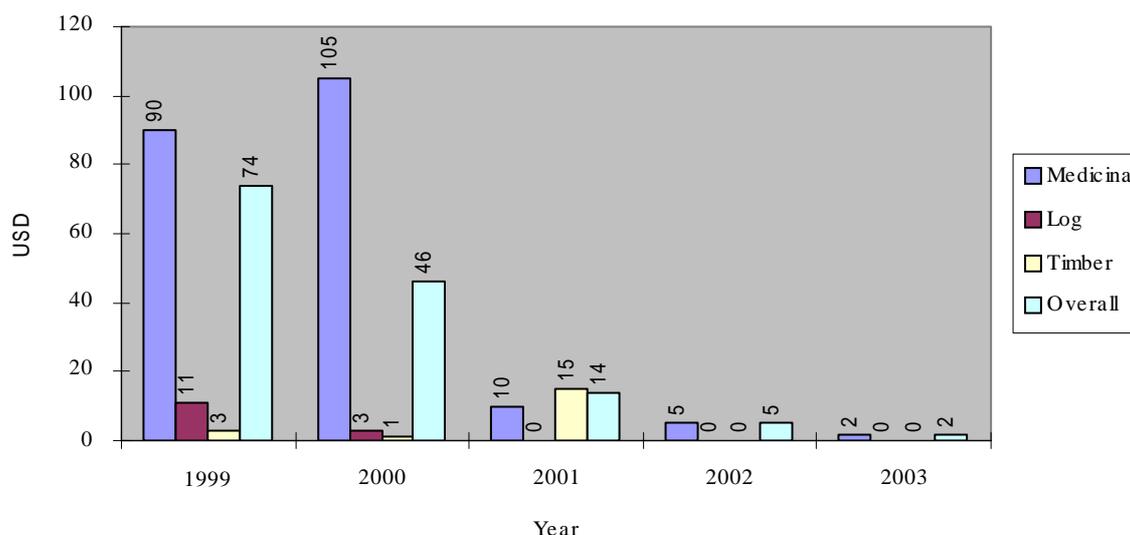
**Table 15: Comparisons of agarwood import and export amount to/from Taiwan**

(Unit: kg)

	1999	2000	2001	2002	2003	Total
<b>Import</b>	<b>849 202</b>	<b>716 906</b>	<b>589 537</b>	<b>357 567</b>	<b>649 271</b>	<b>3 162 483</b>
<b>Export</b>	<b>7 937</b>	<b>79 167</b>	<b>2 617</b>	<b>5 831</b>	<b>64</b>	<b>185 616</b>
<b>Export / Import (%)</b>	<b>0.9%</b>	<b>11%</b>	<b>0.4%</b>	<b>1.6%</b>	<b>&lt;0.1%</b>	<b>5.9%</b>

The averaged declared value per kilogramme across all categories for agarwood re-exports shows a decreasing trend in 1999-2003 (see Figure 7). The change in declared value of medicinal agarwood re-exports is particularly significant after 2000. The average value per kilogramme of medicinal agarwood for re-export (USD90/kg) was higher than that of import (USD9/kg), but both re-exported agarwood logs (USD4/kg) and timber (USD7/kg) had lower average values per kilogramme than those imported (USD68/kg and USD16/kg respectively).

**Figure 7. Value per kg of Agarwood re-exported from Taiwan 1999-2003**



## RESULTS AND DISCUSSIONS - MARKET SURVEYS

### *Agarwood classification in the Taiwanese consumer market*

Interviews with agarwood traders showed how the Taiwanese consumer market structure differs from the three categories of imported agarwood products. There are two main sources of agarwood commonly used by traders and consumers in the domestic market. One is Vietnamese agarwood, often described as Hoi-An agarwood [會安 or 惠安] (referring to the city of Hoi An, a historically important agarwood trade port in central Viet Nam), which is likely to include agarwood sourced from Viet Nam, Lao PDR and Cambodia. The other is Indonesian agarwood, often described as Shing-Jou / Ching-Jou agarwood [星洲 or 青洲] (referring to the ancient name of Singapore, and recognising its role as an important trade entrepot for agarwood sourced from Indonesia and Malaysia), which includes agarwood originally from Indonesia and Malaysia. There is no direct market information on agarwood from Thailand, however, one trader indicated that agarwood from Thailand may be collected from neighbouring countries rather than its own land because of the scarcity of agarwood remaining in Thailand itself.

Most traders surveyed considered that there was much more Indonesian agarwood than Vietnamese agarwood, by definition, in Taiwan's consumer market due to increasingly limited availability of supply from Viet Nam. The estimates of the ratio between the two 'source types' vary from 1:5 to about 1:10 (i.e. Vietnamese: Indonesian). When these verbal estimates are compared to the official trade data (see Table 8), the volumes of imported Vietnamese agarwood 'source type' (i.e. Viet Nam,

Lao PDR and Cambodia) compared to Indonesian agarwood ‘source type’ (i.e. Indonesia, Malaysia, Singapore) is in excess of 1:3. One trader estimated that market prices for Vietnamese agarwood are about 20-30% higher than Indonesian agarwood when comparing raw materials of the same grade. According to the Customs data, during 1999-2003, the average declared import value of Vietnamese agarwood (Vietnam and Lao PDR, average USD25/kg) is 250% higher than that Indonesia agarwood (Indonesia, Malaysia and Singapore, average USD10/kg). However, there is no further information to identify which grades of agarwood raw materials are imported from these countries respectively to verify the estimates provided by the traders.

### ***Locating, acquisition and transportation of agarwood for import***

There are three main patterns found during the survey in which Taiwan importers locate and acquire agarwood from outside of Taiwan:

- 1) *Locating sources by importers themselves:* Several importers specializing in agarwood, particularly higher-grade agarwood, claimed that very often they go to countries of origin to seek direct sources of agarwood. Some showed pictures of working with indigenous people in deep forest in countries such as Indonesia and Vietnam. One importer explained that they take specific agarwood samples as reference materials for the scent they are looking for and co-operate with local people to locate the sources.
- 2) *Locating sources by traders in countries of origin:* Most importers work with traders in countries of origin to locate sources. Many importers emphasized that whenever possible they always check on the quality of the stock on site before shipping it to Taiwan because of extremely high cost of agarwood and the importance of quality control.
- 3) *Locating sources by traders in Singapore (re-export from country of origin):* Two importers who import agarwood for medicinal purpose indicated they rely on traders in Singapore to locate agarwood of the quality they demand. The importers in Taiwan do not necessarily demand agarwood from any specific species or country of origin but rather focus on the quality of the agarwood, and their partners in Singapore will collect the stock and manage all necessary documents and permits.

It was confirmed by a number of importers and in discussion with a Customs official that due to agarwood’s relative high price and low quantity of each shipment (mostly less than 100 kg), most imported agarwood items are transported by air shipment (which differs, for example, from sandalwood which is mostly shipped by the container load). The only possible exception could be agarwood logs which are likely to be shipped by container loads. The Customs official has also observed quantities of agarwood being transported in passengers’ personal luggage. This is legal as long as carried-in items do not exceed 20 kg (per person), accompanied by an invoice, and the status of carry-in items does not violate quarantine regulations, *i.e.* the items carried in are not live specimens and do not have soil attached (Directorate General of Customs, *pers. comm.* to TRAFFIC East Asia-Taipei, April 2004).

### ***Types of agarwood items imported***

The majority of agarwood items imported under the three agarwood C.C.C. codes are agarwood pieces of various sizes, and woodchips, while raw powder is unlikely to be imported into Taiwan. This conclusion is based on official monitoring at a major Customs checkpoint, backed up by traders’ statements that all agarwood raw powder is processed in Taiwan from agarwood pieces or chips. Recorded imports of agarwood logs are also comparatively low (see Table 6). There is no official data for import of agarwood oil. Although agarwood oil is available from several retailers in

Taiwan, market survey findings show no oil extraction or processing in Taiwan. Considering the relatively low demand and high value, it appears very likely that the oil would be hand-carried into the country.

### *Grading*

There are various systems adopted for agarwood grading. Many traders claim that each country (of origin or import) has its own agarwood grading system, but there is no record of a systematic explanation of these systems, or the way these scales are interpreted in Taiwan. Based on the information supplied by the traders surveyed, the following characteristics are the major indicators for distinguishing agarwood grades:

- *The amount of resin content and resin distribution*

The higher resin content an agarwood piece has, the higher the price. High resin content allows wood pieces to produce a purer or higher-level scent as well as provide greater therapeutic effect. The most common method of grading is to place agarwood pieces into water, and then the pieces are classified into three basic grades: sinking, half-sinking (or half-floating) and floating. Sinking pieces (the literal meaning of the Chinese name for agarwood, Ch'en H'siang is "sinking fragrance") are top grade and the rest are divided into different grades based on diverse standards, including the pattern of resin distribution in each piece. Higher resin content also gives an agarwood piece more weight than others in similar size. Many traders also stated that agarwood grading is very subjective, meaning that it takes years of experience to learn to distinguish accurately between different types and grades of agarwood. However, one trading company based in Korea, but with a long experience of dealing with the Taiwanese market, believes that there is substantial amounts of fake or adulterated Ch'en Hsiang currently available in Taiwan's consumer market, and that the Ch'en Hsiang classification is mis-applied to agarwood of lesser quality (Chim-Hyang Corporation, *in litt.* to TRAFFIC Southeast Asia, 2004).

- *Colour and scent*

A number of traders who specialize in high-grade agarwood indicate that agarwood from different countries/islands of origin contains distinctive resin coloration. It is said that the colour of resin that an agarwood piece holds is the main factor determining its scent when it is burnt. The colours mentioned include: green, dark green, yellow, golden, red (purple), black, brown, and white. The darker an agarwood piece, the higher resin content and therefore the higher grade (*i.e.* sinking in water plus dark colour) (Barden *et al*, 2000; Song, 2002). In the general retail market, most traders (retailers) explained that scent is the major factor influencing a consumer's decision. In general, agarwood materials and products producing a softer scent are considered as higher grade, are more popular and are sold at higher prices in Taiwan than those producing a more intense scent. There are no systematic indicators that demonstrate a uniform relation between colour, scent, grading and pricing.

- *Causes of formation, age and location in a tree*

Agarwood raw materials extracted from dead trees buried in the ground or from a swamp are generally considered more 'mature' material, which can contribute to higher grading and higher prices than agarwood extracted from a standing tree. When comparing agarwood taken from different parts of the same tree, agarwood from the roots is considered higher grade than agarwood from higher parts of a tree.

- *Size and form*  
For agarwood pieces, when two pieces are at a similar level of grade according to other characteristics, the value of the larger piece could be many times more than the ratio between the pieces' respective weights. Agarwood pieces that have natural shapes of aesthetic value are usually picked out by traders to be sold at higher prices to agarwood ('art') collectors.
- *Source and scarceness*  
Agarwood items from sources known to have increasingly scarce supplies, such as those from Vietnam, are sold at much higher price than other items of similar grade.

### ***Processing and manufacturing***

Agarwood for medicinal or non-medicinal purposes is usually imported to Taiwan by different importers that follow separate trade chains. The processing and manufacturing of agarwood imported for medicinal use will be described in the later section.

When agarwood pieces and chips are imported to Taiwan for non-medicinal purposes, those with higher resin content or having aesthetically pleasing natural shapes are first separated out and are prepared for sale in three different ways: left in natural 'aesthetic' shapes, made into sculpture or carvings by master carvers in Taiwan or China, shaped into beads in Taiwan for wristlets or rosaries.

Following this 'first cut', the remaining agarwood is divided into different grades and is ground into powder either at the importers' self-run factories or facilities contracted by importers. Most of the importers explained that there were two main reasons why they did not import raw agarwood powder: one is for grinding quality control, the processors in Taiwan are believed to produce finer particles; the other reason is that it was impossible to verify the purity of imported powder and the potential loss could be extremely high even if only a few per cent of lower-grade or substitute powder were blended prior to import into Taiwan.

The majority of raw agarwood powder is later manufactured into various incense products in the factories in Taiwan, and a small portion of raw agarwood powder is sold directly to consumers. All traders surveyed stressed that almost all incense products in the market are made in Taiwan, and only a very small amount of lower-quality incense products coming from China or South East Asia are available, usually in cheap 'night markets'. A small quantity of raw chips is sold to consumers for burning or tea-making.

### ***Purpose of agarwood utilization and items available in consumer market***

#### *Purpose of agarwood utilization*

The purposes of using agarwood and its products in Taiwan can be classified into the following three categories:

- **Religious purpose**  
It has been well recognized that agarwood has a long history in line with the evolution of major religions in the world. In Taiwan, the largest group of agarwood consumers is Buddhists and Taoists, including temples, religious masters and followers. Agarwood items used include incense products (incense, raw chips), raw agarwood powder, and wristlets or rosaries of agarwood beads. A small number of individuals also purchase agarwood oil, sculptures of Buddha and pieces in natural shapes. Many traders explained that Buddhist masters and devotees prefer agarwood raw materials (chips, raw powder) and high-quality incense products. They believe that the scent of high quality

agarwood may assist them in reaching higher degrees of self-purification while meditating or practising religious devotions. Taoist families often use middle to lower quality agarwood incense products for daily worship.

- **Hobby and collections**

Many traders observed that there is a small but growing number of agarwood consumers in Taiwan that enjoy agarwood products as a hobby. These consumers prefer utilizing high-end raw agarwood powder, chips and incense products for aroma appreciation and purchasing unique agarwood pieces in natural shapes, sculptures, wristlets and rosaries for collections. In general, this consumer type is aged between 20 and 50 years old, and usually a high-income professional (IT professionals, academic associates and entertainers were mentioned).

- **Health**

In TCM, agarwood helps circulation of “qi” energy, and warms the centre of the body, entering the channels of the stomach, kidney and spleen. It has a long history as one of the precious TCM ingredients and is used for treating stomach, kidney and respiratory problems. Recommended daily dosage is 1.5-3g for medicinal purpose (Yen, 1992). Four of the five TCM traders surveyed emphasized that medicinal agarwood needs to be derived from high-quality (high resin) pieces, or Ch’en Hsiang. One TCM practitioner/trader stated that Vietnamese agarwood is preferable due to its less bitter taste. The most common forms of agarwood for crude TCM use is powder or chips (ground into powder or very small bits before use) sold in TCM stores by the gram. One trading house manufactures prepared agarwood medicine in capsules and sells them in its own store.

Agarwood is also utilized in two liquor products in Taiwan, for the purposes of adding aroma to the products as well as increasing the potential therapeutic benefits.

#### *Agarwood items available in consumer market*

- **Agarwood pieces and sculptures**

Agarwood pieces in natural shapes and sculptures are the highest-value items in the Taiwanese consumer market. There is hardly any price structure; rather the value is based on individual negotiations between traders and buyers. One trader estimated that the range of agarwood pricing in the international market is from >USD1 000 to <USD100 000 per kilogramme. It is not uncommon that one piece can be sold for over TWD1 million (about USD 30 270). Prices for sculptures are set based on both the grade of agarwood piece and the degree of carving skill. Although the buyers of these items are considered a very specific group and the majority of retailers do not include these items as their main business in their overall agarwood business, most retailers will display several sample pieces of these items in the window or showroom to draw the attention of potential customers.

- **Agarwood chips**

Only a small portion of agarwood chips is sold directly to consumers. Traders surveyed described those consumers that purchase agarwood chips as mostly doing so for use in the appreciation of fragrance. They consume in very small quantities but require very high quality woodchips. Some retailers are now promoting a “new fashion” of using agarwood chips to make tea. The method is to put two or three chips in a kettle or thermos with 2-3 litres of boiling water. The water with agarwood fragrance can be drunk directly or be used for making other tea. The same chips can be used repeatedly from one week to one month, depending on the quality of the chips. The retailers claimed that it is helpful to respiratory system, heart and general health.

- Agarwood raw powder

The majority of agarwood raw powder is sold wholesale to factories for incense production, while a small portion is sold directly to end-consumers. There was a very wide range of wholesale prices of raw agarwood powder found during the survey, from TWD750 / kg to TWD50 000 / kg (USD 23-1 515 / kg). The prices of raw agarwood powder are about 10% higher than those of chips of the same grade of agarwood, taking into account the approximate 10% loss of weight when grinding chips or pieces into powder. The raw powder purported to originate from Vietnamese agarwood was priced at 200% more than Indonesian agarwood powder. Most retailers repackaged powder into packs of small quantity, such as 75 g or 150 g. Middle to higher grade powder is popular among Buddhist masters and devotees, as well as hobbyists. The middle to lower grade powder is frequently used at temples or by Taoist families for daily worshipping.

- Agarwood oil

Agarwood oil found in Taiwan, as stated by traders, is entirely produced prior to import into Taiwan. Among nine traders that sell agarwood oil, five identified that their oil was from Indonesia; two claimed it was from Vietnam and four did not specify the source (notably, some traders sell oil from more than one country of origin). The prices ranged from TWD240 / ml to TWD2000 / ml (about USD 7-61 / ml). At one trading house where both agarwood and sandalwood oil was available, the cost of the former is almost eight times of that of the latter. Buddhist masters and devotees buy agarwood oil for use as a body fragrance. A number of traders and consumers also use agarwood oil to polish sculptures of Buddha and beads. Several traders expressed that the cost of agarwood oil is extremely high, and, additionally, the price of agarwood oil from the countries of origin has increased by about 300% in the past 10 years. With the difficulty of finding regular buyers, traders' interest in selling agarwood oil has also decreased.

- Agarwood incense products

The first recorded use of incense in China was dated in the Chou Dynasty (1066-256 B.C.). Spices came into China as offering tributes and trade items from neighbouring territories. During the time, use of incense was a fashion among the rich and nobles (the ruling class) only. It was until the introduction of Buddhism to China from India near the end of Han Dynasty (about 65 A.D.) that incense burning became linked to religion and the daily life of the general public in China, including the utilization of incense sticks to measure time before the invention of the clock (LIN, 2002b). In the Song Dynasty, the use of incense for fragrance appreciation became a more common cultural practice. A special ceremony was developed for incense appreciation as well as for flower arrangement, tea and painting appreciation respectively. The culture and the ritual entered Japan and evolved into the *koh-doh* incense ceremony still practised today (Liu, 2002; Lin, 2002a).

Nowadays, incense usage in Chinese societies follows two different trends: religious purpose and fragrance appreciation. Incense sticks are the main items used for religious purposes. Traditional incense stick formulas combine powder made of various natural herbs and spices, for aroma, ingredients to aid burning and to bind the stick together, with a final touch of high quality fragrance, such as sandalwood, agarwood or musk (Liu, 2002). Incense sticks generate smoke when burning, and religiously the smoke represents a messenger bringing prayers to the gods, or a linkage between the gods and mortal devotees. Some of the more modern high-end formulas in Taiwan utilize pure agarwood or pure sandalwood only, plus natural adhesive agents (Fu, 2002).

Fragrance connoisseurs prefer to burn raw materials, such as wood powder and chips, rather than incense sticks for the reason that burning powder and chips generates less smoke and purer scent. However, there is considerable overlap between the usage of different materials (raw materials and incense products) and different purposes (religion and hobby) (Fu, 2002). One incense trader

interviewed explained that there are three main types of incense available on the current aromatic product market in Taiwan: agarwood incense and burning materials (including powder, chips and incense products), sandalwood incense and burning materials (including powder, chips and incense products) and TCM incense (medicinal incense products).

The price level of incense products made from the same grade of raw agarwood powder can be roughly listed in ascending order (when measured in the same weight): standing incense sticks and incense cones, lying incense, incense coils. The price differentials correspond to the percentage of pure agarwood powder used, the technical requirements for production and the level of consumer demand. The price range of incense products is extremely large, from TWD200 / kg (about USD6 / kg) to TWD3000 (about USD91) for a dozen incense sticks.

- Agarwood beads

Agarwood pieces are also made into beads for religious purpose. One trading house explained on its website that traditionally the Buddhist masters used rosary beads made from agarwood because: i) an agarwood rosary can assist meditation and the pursuit of inner peace; ii) in case of emergency agarwood beads can be ground and used as life-saving medicine (Anon., 2004c). All surveyed traders but one specified that the beads are manufactured in Taiwan due to quality control. The beads are made into wristlets or rosaries (always of 108 beads), with the quality and pricing based on three factors: whether the materials sink in water or not, the diameter of each bead and the quality of cutting.

Three traders gave similar explanation on how agarwood beads are produced: Firstly, a piece of Ch'en Hsiang (sinking agarwood) is selected for cutting into beads of different diameters, usually ranging from 5-25mm in diameter. Secondly, all beads will be given the 'water test' again, and sinking and non-sinking beads will be made into separate products with different prices. Most of the traders sell these products by pricing per bead. The prices of sinking beads could be 200-300% more than non-sinking beads from the same trader. For example, sinking beads of 10 mm in diameter were priced ranging of TWD300-1200 (about USD9-36) each while non-sinking beads were at TWD100-700 (about USD3-21) each.

The major consumers of agarwood bead products are Buddhist devotees and masters as well as art or agarwood collectors. However, a number of traders claimed that agarwood bead products are not very popular for several reasons: the beads made from higher-grade agarwood are too expensive for general consumers; the beads made from agarwood of middle to lower grade are not aesthetically pleasing; and the less-than-perfect nature of the wood (its texture is rougher than other carved wood). Traders explained that they needed to build up their own special consumer networks to promote such products.

- Agarwood medicines

#### *Crude medicine*

Several agarwood traders and manufacturers noted that agarwood raw materials used (i.e. pieces or chips ground into powder) for TCM purposes need to be of higher quality. The wholesale prices of agarwood raw materials for crude TCM use range from TWD18 333 / kg to TWD33 333 / kg (about USD556-1 010 / kg). In TCM retail stores, agarwood is sold in powdered form or very small chips by the gram in several different grades (but without specifying country of origin). The retail prices range from less than TWD100 to several hundred TWD per gram (less than USD3 to less than USD30 per gram). Traders explained that the market for agarwood used in TCM has a very long history in Taiwan and has been traditionally very stable. However, specialist TCM traders further explained that the supply of quality raw materials has become more and more limited in the

countries of origin – thus the market prices are higher even though the level of demand has remained constant. One TCM importer (said to be a medium-sized trader) estimated their annual amount of medicinal agarwood import is between 600-1200 kg.

#### *Prepared medicine*

Agarwood powder is also used in prepared, formulated TCM products. Based on a list of unified formulas approved by CCMP, TCM pharmaceutical companies or manufacturers may develop their own prescriptions based upon reference texts (Anon. 2004d). Manufacturers apply for licences that recognise and approve their developed ‘in-house’ formulas. However, not all licensed formulas will be manufactured into actual products. According to the data provide by CCMP, there are 47 valid manufacturing licences for prepared TCM products containing agarwood as an ingredient. Among those 42 are over-the-counter medicines and five are medicine for prescription or hospital use only; 42 are oral medicines, two for external use and three without specific description. Among those, over 80% of the items contain less than 6% of agarwood in each dosage (see Table 16). One licence is designated for export only.

**Table 16: Percentage of Agarwood in Each Dosage of Licensed TCM Products**

%	0-2%	2.01-4%	4.01-6%	6.01-8%	8.01-10%	Total
<b>No. of Products</b>	13	11	15	6	1	46

Note: One product is measured in *ml*, excluded from the statistics above.

Source: CCMP

However, there are no statistics available concerning the number of these licensed TCM products that are actually manufactured and sold in the market. In addition, a number of pharmaceutical companies / manufacturers obtained their licences before the GMP system used by the Ministry of Interior. After the current administration for medicine regulation was established, the Department of Health has been keenly promoting the GMP system. Starting from the 1<sup>st</sup> March 2005, the Government will prohibit the existence of any non-GMP pharmaceutical companies or manufacturers after an ‘amnesty’ period for transformation and up-grading expires. Non-GMP pharmaceutical companies or manufacturers which hold valid manufacturer’s licences will be forbidden to continue to use the licences or need to contract out the manufacture to other GMP pharmaceutical companies or manufacturers. As a result, the number of valid licences containing agarwood will undergo a change in early 2005 irrespective of existing licence validity (see Table 17).

**Table 17: Expiration Year of Current TCM Products Licences Containing Agarwood**

Year	2004	2005	2006	2007	2008	2009
<b>No. of Products</b>	13	14	0	2	13	5

Source: CCMP

However, the CCMP officer interviewed stated that once a species has been listed on the CITES Appendices or relevant domestic laws as a species restricted or banned from trade, the Department of Health will immediately announce a deadline for restriction or suspension of manufacturing and trading of pharmaceutical products containing the species as an ingredient, despite the validity of current licences or other certificates. Manufacturers may also have the option of producing the same products without restricted ingredients.

One trader surveyed works with a GMP manufacturer to produce agarwood capsules at TWD1350-2600 for 30 capsules (about USD41-79, roughly USD1.4-2.6 per capsule). Each capsule contains 0.5 g of agarwood.

- **Liquor with agarwood**

Two kinds of liquor products produced by the Taiwan Tobacco and Liquor Corporation (formerly as Taiwan Tobacco and Wine Board), the long-time government-own wine and liquor manufacture monopoly in Taiwan, contain agarwood as an ingredient (Song, 2002). These are Ng Ka Py Liquor at TWD130 (about USD4) for 0.3L and Chu Yeh Ching Liquor at TWD140 (about USD4) for 0.3L. The factory that produces these two products explained that including agarwood in the formulas / recipes serves both aromatic and medicinal functions. However, the agarwood content in the liquor is not listed on the labels nor used in any publicity. From 1994-1997, the corporation used between 1000-2000 kg agarwood raw materials annually (Song, 2002). As the Corporation is currently in transition to become privatized, it proved difficult to obtain any agarwood-related trade information after 1997.

- **Other products**

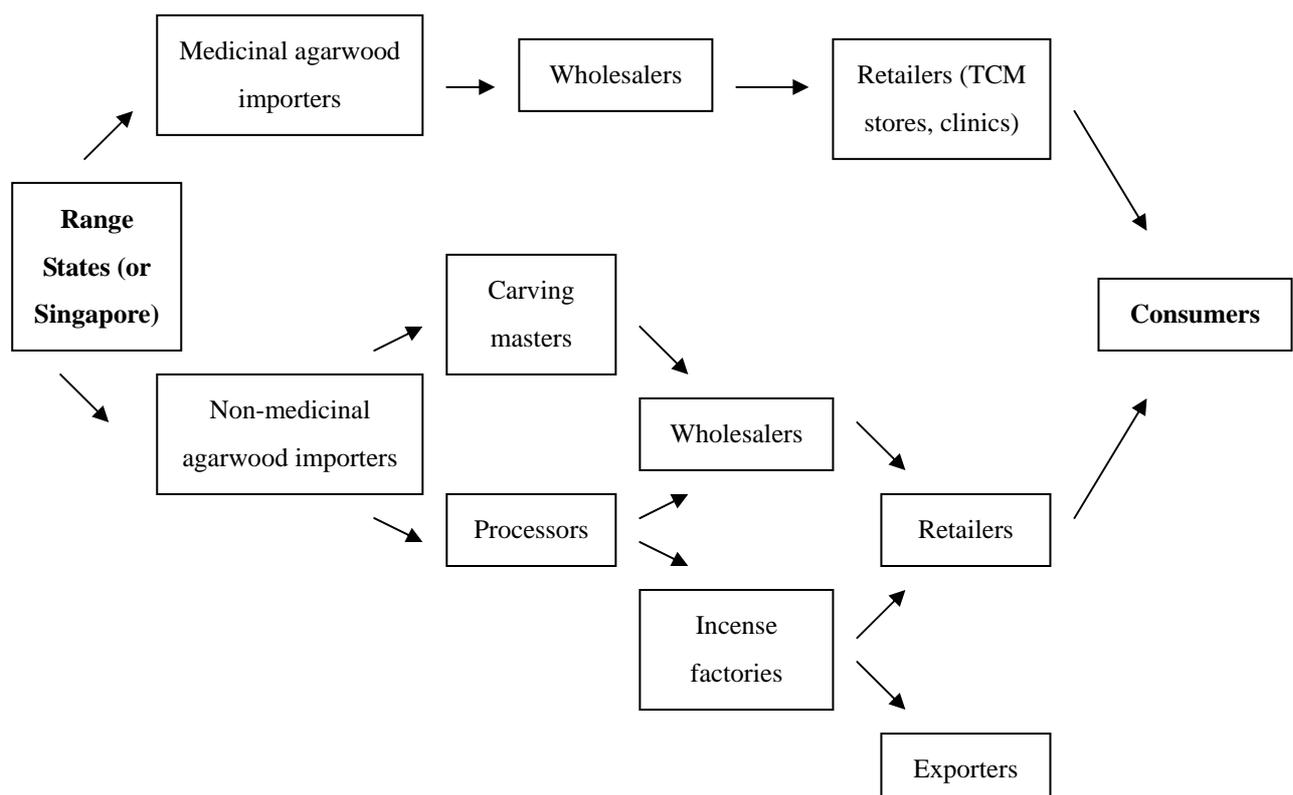
One trader also offers agarwood tea bags at TWD53-150 (USD 1.6-4.5) per tea bag, soaps at TWD700 (about USD21) per box, and name seal materials at TWD16000-18000 (about USD485-545) per piece.

### *Agarwood traders and trader behaviour*

#### *Numbers and business types of agarwood traders*

The business types of agarwood traders found in Taiwan market include importer, processor, manufacturer, wholesaler, retailer and exporter. The trading channels and the market of agarwood for incense and for medicinal use are relatively separate (see Figure 8). According to the database provided by TAITRA in October 2003, there are 35 importers and 3 exporters that trade in agarwood items. However, as some trading houses have registered under several different names, the number of operating trading houses would be lower.

**Figure 8: Trade chains for medicinal and non-medicinal agarwood**



Similar to the typical style of small and medium business operation in Taiwan, the majority of the agarwood traders perform more than one role in the trade chain and manufacturing. For example, nine traders surveyed conduct the steps of import, process, manufacture and wholesale in-house (see Table 18). With the exception of a number of religious supplies chain stores, the majority of agarwood traders are family business, for both incense and medicinal use. Some retailers targeting higher-end market import their own raw materials.

**Table 18: Business Types of Agarwood Traders Surveyed**

Usages of Agarwood	Importer	Processor	Manufacturer	Wholesaler	Retailer	Exporter	No. of Traders
TCM	*			*			4
					*		1
Tonic Wine		*	*	*	*		1
Incense & Other Non-medicinal Use	*	*		*			2
	*	*	*	*			4
	*	*	*	*	*		3
	*	*	*	*		*	1
			*	*	*		1
	*			*	*		1
	*	*	*	*	*	*	1
					*		3
TCM, Incense & Other Non-medicinal Use	*	*			*		1
<b>Total</b>							23

Source: TRAFFIC market surveys

Based on the information available in the TAITRA database, 27 companies identified Indonesia, six identified Viet Nam, three identified Singapore, two identified Malaysia and Thailand respectively and one identified Laos as their source of agarwood (NB: some importers identified more than one source) (see Table 19).

**Table 19: Major Source Countries of Agarwood Imports Identified by Importers in Taiwan**

Source Country	Indonesia	Laos	Malaysia	Singapore	Thailand	Vietnam
No. of Traders	27	1	2	3	2	6

Source: TAITRA

There has been limited exchange of information within the Taiwanese incense industry. One incense trader whose family has been in the incense business for three generations explained that traditionally there have been different preferences for incense formulas in different parts of Taiwan. As a result, the incense manufacturing industry is highly territorial. Despite the existence of some local groups of incense manufacturers in some areas, there is no truly representative “incense association” in Taiwan.

Importers of agarwood for non-medicinal purpose can be trading houses or individuals, yet individual agarwood importers do not appear in the TAITRA database. It is thus difficult to assess the significance of these importers to the overall agarwood market in Taiwan. The significance of agarwood items hand-carried in by individual passengers, in terms of volume, grade, type and use, is unknown.

*Connection of agarwood business to other business*

- Agarwood and religious supplies

The business of religious supplies (for both Buddhism and Taoism), in which agarwood plays an important constituent role, has been booming throughout the past decade.

- Agarwood and sandalwood

Another associated (non-medicinal use) commodity sold by all agarwood traders surveyed is sandalwood and sandalwood products, assumed to be because of the close traditional connection between agarwood and sandalwood in the traditional Chinese incense culture.

- Agarwood and tea

A number of wholesalers explained that traditionally agarwood incense retailing is closely connected to tea retailing. No obvious connection was found during the survey, but one of the large manufacturers surveyed claimed that one of the largest tea corporations in Taiwan was interested in the possibility of selling high-quality agarwood incense products in the franchise stores of the corporation.

- Agarwood and health food / organic products

In order to serve consumers who care for both their physical and spiritual health, a number of stores selling health food / organic products also offered selected agarwood items. According to these retailers, agarwood consumers at this type of store use agarwood and its products mostly for fragrance appreciation and for meditation.

*Profit for traders, market fluctuation and stockpiling*

- Profit for traders

Based upon information and analysis provided from the traders surveyed, the profit margins from wholesaler prices to retail prices are roughly of the following magnitude: less than 100% for agarwood oil; 100% for agarwood chips for non-medicinal use, powder and incense; and 500% for chips for medicinal use (largely due to consumers' needs in extremely small quantity). No information was available either for the estimation of profit margins from importers to wholesalers or for agarwood pieces, sculptures and beads (see Table 20).

**Table 20: Estimated Profit Margins of Different Types of Agarwood Items, from Wholesale to Retail**

<b>Types of Agarwood Items</b>	<b>Estimated Profit Margin</b>
Chips for non-medicinal use	100%
Raw powder, incense products	Less than 100%
Chips for medicinal use	500%
Large pieces, sculptures, beads	Not available

*Source:* Market surveys

- Market fluctuation

All traders surveyed complained the high and largely unpredictable fluctuation of agarwood supply and import prices. For such reason, all traders sell manufactured agarwood incense products within a steady price range to maintain the loyalty of their customers but sell agarwood raw materials (such as wood pieces, chips and powder) according to international market fluctuations. Customs data show the fluctuation in import volumes during 1999-2003 (Table 8 and Figure 4); however, there is no sign of growing unit value from the figures declared to Customs (Table 9 and Figure 5).

- Stockpiling

A number of non-TCM agarwood importers and incense manufacturers expressed that they have “reserves” of agarwood raw materials in storage. The main factors of keeping the stock include:

- i. Unstable supply and pricing of raw materials from countries of origin;
- ii. Unstable quality / scent of raw materials: by keeping certain amount of raw materials of similar quality, manufacturers may maintain the capacity of adjusting formulae to ensure product quality;
- iii. Fear of insufficient or restricted supply / source in the next 10-20 years.

Among these traders, three claimed that they have enough agarwood in stock to ensure supply for their business for more than 10 years. One of them claimed to have invested TWD70-80 million (USD2.12-2.42 million) in securing his agarwood business. A number of traders of aromatic agarwood products claimed that the fragrance of agarwood raw materials would enhance year after year, thus the prices would also rise by 10-30% yearly in stock. The same condition is believed to apply to fragrance of agarwood incense products made of pure agarwood powder.

Medicinal agarwood traders stressed, however, that they did not keep any agarwood raw materials in storage for more than 12 months for fear that the quality and effect of the materials would deteriorate over time.

#### *Understanding of existing trade regulations and views on future trade control*

Among all 23 traders surveyed, two could explain clearly about CITES regulations regarding agarwood derived from *A. malaccensis* and about CITES Appendix II; one trader mentioned that agarwood is under regulation of an international treaty but did not specify CITES.

Regarding CITES regulation, one experienced trader pointed out that the Customs officers have no capacity to identify agarwood from different agarwood-producing species. Even for experienced traders they need to work for years and years to memorize hundreds of different scents as their foundation of identification.

A number of traders surveyed believed that there will be tighter restriction on international trade of agarwood and that as a result the consumer market will turn into a market for the very rich. Others believed that although the sources will be limited, the domestic market will not be banned due to religious reason.

One medicinal agarwood trader stated even though their family had been dealing agarwood for generations, they have very little information on the overall situation of the international agarwood market.

#### *Definition of “fake” agarwood items*

The majority of traders surveyed highlighted that there is a lot of “fake” agarwood and agarwood products in Taiwan’s retail market, usually presented in the following ways:

- High-grade agarwood replaced by low-grade stock painted with or soaked in agarwood oil;
- Substitution of other fragrant woods or artificially coloured wood masquerading as true agarwood ;
- Substitution of other wood impregnated with artificial agarwood fragrance.

Additionally, as mentioned previously, there are some concerns with the lack of specific application of the term Ch'en Hsiang to describe agarwood of lesser quality, which does not meet the exacting classical standards of 'real' Ch'en Hsiang (which has now become extremely rare in the global market) (Chim-Hyang Corporation, *in litt.* to TRAFFIC Southeast Asia, 2004).

#### *Trader behaviour in relations to socio-economic conditions in Taiwan*

In the past 2-3 years, Taiwan has suffered greatly from an economic downturn. A number of importers noted their business had become more conservative in terms of investment and had minimized or even stopped agarwood imports because of the economic downturn. These findings correspond to the figures of Customs import data which show a steep drop of agarwood imports in 2001 and 2002 (Table 5 & Figure 4), however, it should be noted that volumes began to increase again in 2003. One trader mentioned that current political problems also have had an influence on his much more conservative investment approach. At the same time, the economic downturn and the current socio-economic development (e.g. the boom of IT industry) in Taiwan has divided the consumer market into two growing extremes: markets for extremely high-end, and extremely low-end, products. In response, some agarwood retailers have begun to focus on consumers at these respective extremes. In addition, one trader in the south of the island estimated that all agarwood items of similar grades are about 20% cheaper in the south of Taiwan than those in the north due to higher living standards in the north of the island.

#### ***Consumer behaviour (based on of traders' observations)***

During the market surveys, there was no direct access to end-consumers. The following description of agarwood end-consumers is based on the observations of agarwood traders.

#### *Types of consumers*

There are two main types of agarwood consumers in Taiwan:

- Religious practitioners and followers: Buddhist and Taoist temples, masters and followers;
- Hobbyists, art or antique collectors: the young-to-middle age upper-middle class professionals, such as professionals in IT industries, academia and the business sector.

#### *Preference for various agarwood items*

Two traders gave similar estimation that the general consumers who purchase agarwood and agarwood products in Taiwan, 70% of them use agarwood incense, 20-30% of them use raw agarwood powder and the rest of them use agarwood chips. In general, consumers in the north and central Taiwan prefer agarwood items of middle to high grades / prices and agarwood incense with softer tones and with a mixture of TCM ingredients; whilst the consumers in the south of Taiwan prefer agarwood items of middle to lower grades / prices and pure agarwood incense with intensive fragrance.

#### *Consumer understanding of agarwood and its products*

All traders sensed that the majority of agarwood consumers in Taiwan have little or no general knowledge on agarwood. Any relevant information is usually obtained by word of mouth or via the Internet, and an 'agarwood club' for members interested in fragrance appreciation was established three to four years ago, focused on the high-end market. Some devoted Buddhists and hobbyists

consult traders to increase their knowledge of agarwood.

#### *Consumer behaviour in relation to socio-economic conditions in Taiwan*

As mentioned in the earlier section, the economic downturn and current socio-economic dynamic has influenced the breaking of the agarwood market into two sectors (high price and low price). The high-end market demand is characterized by agarwood items of specific grades or for special purposes; while the low-end market demands agarwood items of larger quantity under the same cost.

#### *Viewpoints on agarwood trade regulations from government authority*

The officer interviewed from the Directorate General of Customs confirmed that Customs officers understand there is only one agarwood-producing species listed on CITES Appendix II. However, no officers are capable of distinguishing *A. malaccensis* from other agarwood-producing species. Thus the trade regulation is only based on information contained on permits. Customs keeps track of trade data at the general level. If keeping track of more specific information about agarwood trade will be significant to the monitoring of the trade, the Customs would like to seek further advice.

### ***Artificial Propagation and Substitutes***

#### *History of artificial propagation of Aquilaria trees in Taiwan*

According to one individual trialling *Aquilaria* tree propagation in Taiwan, the idea and the first stock of *Aquilaria* seeds were brought into Taiwan about 15-20 years ago by an agarwood importer who specialised in sourcing agarwood from South East Asia (mostly Vietnam). There are about 20 people who joined the first group of propagators and each maintains a plantation the size of three fen (about 2910 square meter) growing 200-300 trees. The individual interviewed invested over TWD2 million (USD60 595) in the business, and one 10 cm-seedling cost about TWD2 000 (USD61) 12 years ago.

#### *Current status of artificial propagation of Aquilaria trees in Taiwan*

Most of the *Aquilaria* trees propagated in Taiwan are believed to come from Vietnamese agarwood seedlings, but the exact species is unknown. Results have shown that *Aquilaria* trees survive well in Taiwan and have started to produce seeds within 2-3 years of propagation. A company promoting propagation claims on its web site that propagated *Aquilaria* trees are already in the 5<sup>th</sup> –6<sup>th</sup> generation in Taiwan. The same website advertises seedlings and young trees purporting to be from *Aquilaria agallocha* Roxb. at the price of TWD1 500 (about USD45) per one-year (30 cm) seedling, TWD3 000 (about USD91) per four-year tree treated with fungal preparations and TWD80 000 (about USD2 424) per seven-year old tree (Anon., 2004e). Most propagators drill holes in trees to induce resin formation. The current market for *Aquilaria* seedlings/trees in Taiwan was described as very chaotic, with no standard pricing structure.

#### *Difficulties in propagation*

It was explained that there were two main difficulties in propagation. One difficulty is that there is very little technical information available and very little exchange among propagators on technical or market information. Most of the information they found was from other countries, or via the internet, much of which required translation into Chinese. Time lag between initial investment and return on capital was also described as an inhibitor of further investment.

#### *Prospects for artificial propagation and possibility of substitution*

All traders surveyed believed that it was out of the question to replace naturally formed agarwood with artificially propagated varieties for the reason that the delicate environment that supports agarwood formation cannot be reproduced artificially. The propagator interviewed estimated that

artificially-propagated agarwood will appear in the consumer market in Taiwan in about 10 years. The first possibility is to produce lower-grade agarwood for the purpose of essential oil extraction. It is expected that market potential exists for promoting *Aquilaria* trees as good-luck trees for private gardens. Interviews with a CCMP officer revealed it may be possible to replace natural agarwood for medicinal use with artificial propagated agarwood with a change in market price structure. Nevertheless, with regards as identifying a total substitute for agarwood, in the view of TCM it is not likely to replace one ingredient completely with another. Substitution is only feasible when it is based on each of the functions or effects of one ingredient respectively.

## CONCLUSION

Taiwan's agarwood market has a long history, driven by major streams of demand for both religious and medicinal uses. Recent trends include a slight change in the market structure towards two extremes (high-end and low-end) sectors, mainly due to fluctuations in both sources and quality of supply, as well as price structure, while at the same time the downturn in Taiwan's socio-economic situation has also had an impact.

Taiwan's trade regulations pertaining to agarwood derived from *Aquilaria malaccensis* follows CITES protocols implemented by the Bureau of Foreign Trade. Official data collection by both the BOFT (*A. malaccensis*) and the Directorate General of Customs (all agarwood-producing species) is useful for understanding the general trends of agarwood trade in Taiwan; however, there is not sufficient information to monitor trade in further depth, such as the significance of agarwood trade for medicinal and non-medicinal purposes respectively.

Taiwan's overall agarwood import statistics (more than 6 843 tonnes – agarwood of all types – over the decade 1994-2003) indicate that it is one of the most significant, if not the premier, global market destination. However, due to the lack of trade data on agarwood carried in by individuals, the actual amount of agarwood that has been imported into Taiwan is likely to be even higher than the official records. It is important to further understand the pattern and significance of agarwood carried in by individuals relative to the overall agarwood market, and to assess the effect that Taiwan's total import 'footprint' may be having on wild populations of key source countries for the types of agarwood in demand in Taiwan: Indonesia (plus Malaysia), and Viet Nam (plus Lao PDR and Cambodia).

Many agarwood traders in Taiwan have been in the business for a long period of time, often for several generations. The majority of them have sufficient professional knowledge regarding the Taiwanese agarwood market but have limited understanding of the overall international agarwood market, international trade regulations and the status of wild agarwood populations. Most of the consumers have an even narrower understanding of these aspects, and there appears to be a critical need to raise the awareness of all actors in Taiwan's agarwood market structure.

## RECOMMENDATIONS FOR AGARWOOD TRADE REGULATION IN TAIWAN

The following recommendations are made to encourage better monitoring of agarwood trade:

- I. More detailed records need to be maintained regarding agarwood trade and other official data pertaining to this non-timber forest product. Additional data should include three main elements: i) separate C.C.C. codes for medicinal and non-medicinal agarwood, in order to keep closer track of the amount used for medicinal and non-medicinal purposes as reference of future regulation; ii) a database of information regarding agarwood carried in by individual passengers, in order to fill in the missing part of overall trade records and to the total magnitude of Taiwan's agarwood trade; iii) a database of licensed TCM products that have been produced with annual sales records, in order to find out about the actual uses and trade information of agarwood medicines in the consumer market .
- II. Increase the capacity to identify individual agarwood species by front-line Customs officers, or alternatively, listing all agarwood-producing species under the same level of international regulation.
- III. Educate traders, and consumers, at all levels regarding the current status of wild populations of agarwood-producing species, including the overall dynamics of global agarwood trade before imposing further trade restriction or trade ban. If Taiwanese actors understand the role and impact of their behaviour, it would help greatly to explain the reasons behind any new trade regulation and aid implementation.
- IV. Following the listing of *Aquilaria* and *Gyrinops* species at genus level at the Thirteenth Conference to the Parties of CITES in October 2004, Taiwanese authorities are recommended to pursue direct communications with exporting and re-exporting States to confirm that imported cargoes coming into Taiwan have been approved for legal export.

## REFERENCES

- Anon. (1998). Customs Import Tariff and Classification of Import and Export Commodities of the ROC, Directorate General of Customs, MOF and the Board of Foreign Trade, MOEA, Taiwan
- Anon. (2003a). Taiwan Importers and Exporters Database. <http://www.taiwantrade.com.tw>. October 2003.
- Anon. (2003b). Foreign Trade Act. <http://www.trade.gov.tw/bofteng/>. 9 October 2003.
- Anon. (2004a). Trade Statistics 1989-2003. <http://www.trade.gov.tw/english/page9.htm>. April 2004.
- Anon. (2004b). Introduction to agarwood, grading of agarwood and agarwood items price list <http://www.potiagar.com.tw> (in Chinese). April 2004.
- Anon. (2004c). Introduction of *Aquilaria agallocha* Roxb. (Agarwood), Stories and Historical Facts about *Aquilaria agallocha* Roxb., Grading of *Aquilaria agallocha* Roxb. <http://www.jdcorp.com/chome.html> (in Chinese). May 2004
- Anon. (2004d). Database of unifies formulas, database of licensed formulas. <http://www.ccmp.gov.tw> (in Chinese). April 2004.
- Anon. (2004e). Introduction to artificial propagation and cost-benefit estimation. <http://www.pingmin.idv.tw> (in Chinese). April 2004
- Barden, A. *et al.* (2000). *Heart of the Matter: Agarwood Use and Trade and CITES Implementation for Aquilaria malaccensis*, TRAFFIC Network, Pp 5-11
- Fu, P. F. (2002). Incense Appreciation (in Chinese), *Humanity Magazine* Vol.225, May 2002, Pp 36-39
- Lin, C. L. (2002a). A Touch of Fragrance over Religious World (in Chinese), *Humanity Magazine* Vol.225, May 2002, Pp 14-19
- Lin, C. L. (2002b). Messenger to God (in Chinese), *Humanity Magazine* Vol.225, May 2002, Pp 30-34
- Liu, L. Y. (2002). The Story of Incense (in Chinese), *Humanity Magazine* Vol.225, May 2002, Pp 20-22
- Song, M. (2002). Traditional Chinese Medicine and Medicinal Plant Trade in Taiwan, TRAFFIC East Asia-Taipei, Taiwan. Pp. 56-64.
- Yen, K. Y. (1992). *The Illustrated Chinese Materia Medica: Crude and prepared*. SMC Publishing Inc, Taiwan. Pp. 11.