SOUTH AMERICAN TIMBERS - THE CHARACTERISTICS, PROPERTIES AND USES OF 190 SPECIES

(ALGUNAS MADERAS DE AMERICA DEL SUR - LAS CARACTERISTICAS, PROPIEDADES Y USOS DE 190 ESPECIES)

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National Library of Australia Cataloguing-in-Publication Entry

Berni, C.A.
South American timbers, the properties, uses and characteristics of 190 species.

Index
Bibliography
ISBN 0 643 02582 0

1. Timber - South America. I. Bolza, Eleanor, joint author. II. Christensen, F.J., joint author. III. Commonwealth Scientific and Industrial Research Organization. Division of Building Research. IV. Title.

634.9'7'098

CONTENIDO

PROLOGO

La decisión de publicar el presente trabajo referente a las maderas sudamericanas, se vió facilitada por la muy favorable acogida a nuestra publicación anterior intitulada Maderas africanas - Las propiedades, usos y características de 700 especies. Ésta ha sido de mucho interes y valor para grupos y agencias diversos de las Naciones Unidas, organizaciones de estudios, industrias de la madera y usuarios.

Estos datos de las maderas sudamericanas fueron ectraídos de un número considerable de documentos publicados principalmente en inglés, portugués y español a lo largo de más de 60 años. Con el deseo de ampliar la utilidad del presente volumen, todas las mediciones están dadas en unidades métricas e imperiales, y el texto introductorio y los encabezamientos de tablas han sido repetidos en español.

Las especies descriptas aquí fueron cuidadosamente seleccionadas para que fueran representativas de la región. Alguna omisión evidente fue probablemente excluida debido a la falta de información publicada sobre ellas, un aspecto clue tendió a variar de país a país. Otra consideración fue la gran diversidad de especies que existen en los bosques tropicales y sobre las cuales a menudo faltaba aún una estimación rudimentaria de los recursos.

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I. INTRODUCCION

El aumento general de la demanda de madera en el mundo, particularmente por latifoliadas, ha despertado un gran interés en la extensa variedad de especies que existen en los bosques sudamericanos. Varias de estas especies poco conocidas, también llamadas secundarias, ya fueron exportadas a diversos paises, incluyendo Australia. Han estimulado la preparación del presente trabajo, la indisponibilidad de datos y los frecuentes pedidos de informaciones referentes a las caracteristicas, propiedades y usos de un gran número de estas especies.

Muchas informaciones referentes a las maderas sudamericanas se encuentran dispersas en cientos de publicaciones técnicas escritas en lenguas diferentes y durante mucho tiempo. Aparte del problema que significa el acceso a los trabajos publicados y superar la barrera del idioma, existen problemas potenciales para determinar la exactitud de los resultados obtenidos, particularmente en cuanto a propiedades mecánicas que han sido determinadas por diferentes métodos.

El agrupamiento de datos en formatos para la presentación de las propiedades físicas y mecánicas más destacadas soluciona en gran parte estos problemas. Este sistema permite grandes deficiencias en cuanto a métodos adecuados de muestreo, variaciones en los métodos de ensayos y una falta general de estadística de variabilidad para los datos presentados. Evita además la falsa impresión de la exactitud originada por el uso de valores absolutos.

Este trabajo resume en forma precisa y consistente las informaciones publicadas anteriormente sobre 190 especies sudamericanas, y podría asesorar al interés del consumidor y al de los comerciantes en la selección de las maderas que mejor se adecuen a sus propósitos. El gran listado de referencias bibliográficas podría utilizarse como punto de partida en la obtención de más informaciones sobre estas maderas.

En la descripción de las especies se incluyen maderas indígenas de la América del Sur y algunas especies exóticas que están siendo plantadas, extensivamente, en diversos paises sudamericanos.

La información presentada en este trabajo representa una proporción grande de datos fidedignos, clue han sido publicados en diferentes formas y por diferentes autores, sobre estas maderas en particular.

II. PRESENTACION DE DATOS

El formato para la presentación de los datos se basa en el sistema adoptado por Bolza y Keating (1972).

El objeto de agrupar las informaciones en forma compacta, es proporcionar una descripción clara y simple del aspecto, hábitos de crecimiento, características, propiedades y usos de cada especie. También, permite una comparación simple entre las especies.

Los datos fueron tabulados especialmente para facilitar la obtención de informaciones referentes a cada especie. En todo el texto, las dimensiones son expresadas en base a unidades del sistema métrico (SI), seguidas por unidades inglesas, en paréntesis.

1. Nomenclatura

Las especies son presentadas individualmente en orden alfabético de acuerdo a su nombre botánico.

El encabezamiento del texto descriptivo para cada especie contiene el nombre botánico, el nombre común más utilizado y el nombre de la familia a la que pertenece. El nombre botánico seguido de la letra (H) o (S) indica que la especie se trata de una latifoliada, o conífera respectivamente. El término "Exotic", luego del nombre común, significa que la especie no es indígena de la América del Sur.

Los nombres comunes de los arboles varían frecuentemente de un lugar para otro; as! un nombre puede ser aplicado a mâs de una especie no relacionada. Por otro lado, una especie puede tener una cantidad considerable de nombres distintos. Con el objeto de disminuir esta confusión, se suministra unicamente uno, o a lo sumo dos nombres, por cada especie. Coma algunas especies tienen más de un nombre botánico, también se indican los sinónimos apropiados.

El índice proporciona en orden alfabético, el nombre botánico, algún sinónimo, y el o los nombres comunes de cada especie.

2. Descripción y características

El texto descriptivo para cada especie se inicia con un sumario de los rasgos característicos de la madera, incluyendo color de la albura y el

duramen, ancho de la albura, textura y grano, veteado, presencia de anillos de crecimiento, olor y sabor.

Dentro de lo posible, se suministra informaciones adicionales referentes a la forma y longitud de la troza, y los hábitos de crecimiento de las especies. En muchos casos fueron incluidos la descripción de los terrenos, suelos y las condiciones climáticas que aparecen como favorables a una determinada especie.

Las características de la madera, que se presentan brevemente, incluyen secado, trabajabilidad, acabado y algunas propiedades mecánicas sobresalientes. Otras informaciones generalmente disponibles incluyen resistencia al tratamiento con preservativos, susceptibilidad al ataque de agentes biológicos, comportamiento al curvado por vapor y a la degradación por acción atmosférica, estabilidad dimensional y algunos usos especiales para la corteza, las hojas y los extractivos de la madera.

En la mayoría de los casos, el material de consulta tuvo que ser condensado a fin de ajustarse al formato adoptado. No obstante, todo aquel material considerado de importancia práctica fue incorporado. Además, si existieron diferencias entre las informaciones publicadas se han escogido las características y descripciones más lógicas y generalmente aceptadas.

3. Referencias

Para cada especie, los números se refieren a las publicaciones ordenadas numericamente en la bibliografía. Las informaciones presentadas provienen única y exclusivamente de las referencias citadas para cada especie.

4. Datos tabulados

(a) Arbol

Debido a la gran variación en las dimensiones de los árboles que a menudo se reportan para algunas especies desde lugares diferentes, se presentan los valores de altura y diámetro más representativos de la especie.

(b) Origen de los datos

Los números claves se refieren en particular a los paises ubicados en el mapa de la América del Sur, o a los indicados en la sección titulada

"LIST OF COUNTRIES MENTIONED IN TEXT" (Lista de paises mencionados en el texto). Éstos no significan necesariamente distribución geográfica de las especies.

El término "native", ubicado bajo un número clave, significa que los datos fueron obtenidos del país donde la especie exótica es indígena.

(c) Densidad

El sistema de código para densidad que muestra el cuadro 1, sigue el método utilizado por Kloot y Bolza (1961). Los valores de densidad estân referidos al 12% de contenido de humedad (Densidad seca al aire).

(d) Grupos de resistencias

El sistema para agrupar las resistencias se basa en lo propuesto por Pearson (1965, 1966) y subsecuentemente adoptado en Australia.

El cuadro 2 muestra los valores mínimos de ensayos normalizados para flexión estática (Módulo de ruptura y módulo de elasticidad); compresión paralela al grano (Resistencia unitaria máxima); cizallamiento paralelo al grano (Resistencia unitaria máxima), para cada uno de los siete grupos hipotéticos. Están indicados como resistencias actuales en los grupos S1 a S7 para material verde y como resistencias estimadas para el material seco al aire. Los valores de resistencia utilizados provienen de ensayos realizados en probetas pequeñas y libres de defectos.

Cuando los datos disponibles fueron insuficientes para asignar definitivamente una especie a un grupo particular de resistencia, se proporciona una clasificación tentativa entre paréntesis.

(e) Contracción

El cuadro 3 muestra el sistema de código para la contracción, como porcentaje de la dimensión verde. Las cifras indican valores para la contracción radial y tangencial, desde el estado verde al seco al horno, y desde el estado verde al 12% de contenido de humedad.

(f) Durabilidad

La durabilidad. natural es la resistencia al ataque de hongos que presenta el duramen en contacto directo con el suelo.

La resistencia a la pudrición de muchas maderas varía en gran medida, aún entre las piezas de un mismo árbol. Consecuentemente, la expresión de durabilidad es únicamente posible en términos aproximados. Por esta razón, las maderas están clasificadas en cuatro amplias clases definidas en el cuadro 4. Esta clasificación no se refiere a la albura, la cual no es durable en casi. todas las especies.

Para condiciones significativamente menos riesgosas que el contacto directo con el suelo, la expectativa de vida de la mayoría de las especies sería obviamente mayor que la indicada en esta clasificación.

Los paréntesis se han usado, en la columna de durabilidad de cada especie, cuando la clasificación es tentativa o está basada en información insuficiente o contradictoria.

(g) Susceptibilidad al ataque por Lyctus

Los insectos del género Lyctus atacan solamente la albura de ciertas latifoliadas (con un deterrminado contenido de almidón). Si la albura es pequeña la susceptibilidad al Lyctus no es importante para maderas estructurales (Beesley 1956).

La susceptibilidad al ataque del Lyctus perforador se designa tanto por S, que significa susceptible, como por N que significa no susceptible. Debido a una ausencia ocasional de datos autorizados, algunas susceptibilidades al Lyctus deben ser aceptadas con reserva. Los parentesis se ban usado cuando la clasificación es tentativa.

(h) Usos

Los usos reportados, descriptos para cada especie, están indicados por los numeros de código dados en el cuadro 5. Esta lista de usos no es completa, es simplemente para indicar las aplicaciones comunes importantes de estas maderas.

Algún uso especial, o uso posible como substituto para especies bien conocidas, se menciona en el parágrafo "Characteristics" de la especie tratada.

III. REFERENCIAS

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CONTENTS

FOREWORD

The decision to publish the present work on South American timbers was facilitated by the highly favourable response to our earlier publication entitled African Timbers - The Properties, Uses and Characteristics of 700 Species by E. Bolza and W.G. Keating. This has been the subject of much interest and value to groups as diverse as United Nations agencies, research organizations and the timber industry and users.

The data on South American timbers were derived from a large number of technical papers published principally in English, Portuguese and Spanish over the past sixty years. For the purpose of widening the usefulness of the present volume, all measurements are given in both metric and imperial units and the introductory text and table headings have been duplicated in Spanish.

The species described here were carefully selected to be representative of the region. Any obvious omissions were probably excluded because of the lack of published information on them, an aspect which tended to vary from country to country. Another consideration was the sheer diversity of species occurring in tropical forests and on which even rudimentary estimates of the resource are often lacking.

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SOUTH AMERICAN TIMBERS - THE CHARACTERISTICS, PROPERTIES AND USES OF 190 SPECIES

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I.INTRODUCTION

The general expansion in world demand for timbers, particularly hardwoods, has created an increasing interest in the wide variety of species occurring in South American forests. Many of the lesser-known or so-called "secondary" species are being exported to various countries including Australia. The lack of readily available data and constant requests for information on the characteristics, properties and uses of many of these species stimulated the preparation of this publication.

Information on South American timbers is scattered throughout a large number of technical publications written in different languages over a considerable period of time. Quite apart from the physical problem of gaining access to the published works and overcoming any language barriers, there are potential difficulties in assessing the reliability of results presented, particularly in relation to specific mechanical properties determined by differing methods.

The data grouping format adopted for presenting major physical and mechanical properties largely overcomes that problem. Such a system enables gross differences in adequacy of sampling, variations in test procedures and a general lack of variability statistics for the data presented to be accommodated. Also, it avoids the misleading impression of precision sometimes engendered by the use of absolute values.

This work summarizes previously published information on 190 South American timbers in a precise and consistent form. It should assist commercial and consumer interests in selecting the timbers best

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suited to their purposes. The large number of references listed should provide a useful starting point in the search for further information on particular timbers.

The species described include timbers indigenous to South America together with some exotic species which have been extensively planted in various South American countries.

The information presented in this work represents a high proportion of the reliable data that have been published in many forms and by different authorities on these particular timbers.

II. PRESENTATION OF DATA

The format for the presentation of the data is based on the system adopted by Bolza and Keating (1972).

The object of putting the information in a suitably consolidated form is to provide a clear and simple description of the appearance, growth habits, characteristics, properties and uses of each species. It also makes possible a simple overall comparison between them.

Information has been tabulated for easy reference and access, thereby facilitating the retrieval of data on each species. Throughout the text, numerical data are quoted in metric (SI) units followed by the imperial units in parentheses.

1. Nomenclature

The timber species are presented individually in alphabetical order according to their botanical name.

The heading for the descriptive text on each species contains the botanical name(s), the preferred common name(s) and the name of the family (and, in some cases, the former one) to which the species belongs. The letters (H) or (S) following the botanical name indicate whether the species is a hardwood (broad-leaved) or softwood (conifer) respectively. The term "Exotic" after the common name means that the species is not indigenous to South America.

Common names of trees often vary from place to place; one name may be applied to more than one unrelated species, while one species may have several distinct names. With the object of reducing this confusion, only one or (at most) two common names are given for each species. As some species have more than one recorded botanical name, appropriate synonyms are also listed.

The index lists, in alphabetical order: the botanical name, any synonym, the authority and common name(s) for each species.

2. Description and Characteristics

The descriptive text for each species begins with a summary of identifying features of the timber including notes on the colour of sapwood and heartwood, sapwood width, texture and grain, figure, presence of growth rings, and any odour or taste.

Wherever possible, additional information on the shape and length of the bole and the growth habits of the species has been given. In many cases, a description of the terrain, soils, and climatic conditions that a particular species appears to favour has been included.

Timber characteristics briefly summarized include seasoning, working, finishing and (any outstanding) mechanical properties. Where available, other data listed include amenability to preservative treatment, susceptibility to attack by biological agents, steam bending properties, weathering characteristics, stability and any special uses for the bark, leaves or wood extractives.

In most cases, the source material had to be considerably condensed to fit within the format of the presentation adopted. Nevertheless, every effort was made to include all material of practical relevance. Furthermore, where differences between published references existed, the most logical and generally accepted description and characteristics were used.

3. References

The numbers given for each species refer to the publications listed numerically in the bibliography. The information presented has been abstracted only from the references cited for each species.

4. Tabulated Data

(a) Tree

Due to the wide variation in tree sizes often reported for some species from different places, the more representative height and diameter of each species are given.

(b) Origin of Data

The code numbers refer to the particular countries shown on the map of South America or given in the section entitled "List of Countries Mentioned in Text". They do not denote the geographical ranges of the species.

The term "native" inserted beneath a code number refers to data obtained from the country to which the plantation or exotic species is indigenous.

(c) Density

The coding system shown for density in Table 1 follows the method used by Kloot and Bolza (1961). The density figures relate to 12% moisture content, i.e. they are the commonly called air-dry density values.

(d) Strength Group

The system of strength grouping is based on proposals made by Pearson (1965, 1966) and subsequently adopted in Australia.

Table 2 gives the minimum standard test values for bending strength (modulus of rupture), stiffness (modulus of elasticity), compression parallel to the grain (maximum crushing strength) and shear parallel to the grain (maximum shear strength) for each of the seven hypothetical groups. These are shown as actual strength groups S1 to S7 for green and estimated ones for seasoned material. All strength values used were obtained from tests on small clear specimens.

Where insufficient data were available to definitely assign a species to a particular strength group, a tentative assessment is given in parentheses.

(e) Shrinkage

The coding system for shrinkage, expressed as a percentage of green dimensions, is given in Table 3. The figures show tangential and radial shrinkage values from green to oven-dry and from green to 12% moisture content.

(f) Durability

Natural durability is the resistance to fungal attack of heartwood in ground contact i.e. timber exposed to a moderately high decay hazard.

The decay resistance of most timbers varies a great deal, even between pieces from the same tree. Consequently, it is only possible to express durability in approximate terms. For this reason, timbers are classified into the four broad classes defined in Table 4. This classification does not refer to sapwood, which is non-durable for almost all species.

For conditions significantly less hazardous than ground contact, the life expectancies of most species would obviously be much longer than that indicated in this classification.

Parentheses are used, in the durability column for each species, where the classification is tentative or based on insufficient or contradictory information.

(g) Lyctus Susceptibility

The Powder-post beetle (Lyctus spp.) attacks only the sapwood of certain hardwoods (with an adequately high starch content). If the sapwood is narrow, then Lyctus susceptibility is unimportant for structural timbers (Beesley, 1956).

The susceptibility to Lyctus borer attack is designated as either S meaning susceptible or N meaning non-susceptible. Owing to the occasional absence of authoritative data, some Lyctus susceptibility ratings must be accepted with reservations. Parentheses are used where the classification is tentative.

(h) Uses

The reported uses of each species are indicated by means of the code numbers given in Table 5. This list of uses is not exhaustive: it is merely to indicate the most important common purposes for which the timbers are suitable.

Any special uses or possible use as a substitute for a well-known timber are mentioned in the "Characteristics" paragraph of the species concerned.

III. REFERENCES

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TABLES

CUADROS

TABLE 1 ***CUADRO 1***

DENSITY CLASSIFICATION

CLASIFICACION DE DENSIDAD

Code Number *Número clave*	Density Densidad	
	kg/m^3	lb/ft^3
1	up to 160	up to 10
2	170 - 200	10½ – 12½
3	210 - 260	13 - 16
4	270 - 320	16½ - 20
5	330 - 360	20½ - 22½
5+	370 - 400	23 - 25
6	410 - 450	25½ - 28
6+	460 - 500	28½ - 31½
7	510 - 570	32 – 35½
7+	580 - 640	36 - 40
8	650 - 720	40½ - 45
8+	730 - 800	45½ - 50
9	810 - 900	50½ - 56
9+	910 -1010	56½ - 63
10	1020 -1140	63½ - 71
10+	>1150	>71½

TABLE 2 ***CUADRO 2***

MINIMUM STANDARD STRENGTH CLASSIFICATION
(based on small clear specimens)
CLASIFICACION DE RESISTENCIAS NORMALIZADAS MINIMAS
(Para pequeñas muestras sin defectos)

Strength Group *Clase de resistencia*	Moisture Condition *Grado de humedad*	Properties Propiedades							
		Modulus of Rupture *Módulo de ruptura*		Modulus of elasticity x 10^3 *Módulo de elasticidad x* 10^3		Maximum Crushing Strength *Resistencia máxima de compresión*		Maximum Shear Strength *Resistencia máxima de cizallamiento*	
		MPa	lbf/in.^{2}	MPa	lbf/in.^{2}	MPa	lbf/in.^{2}	MPa	lbf/in.^{2}
S1	Green*	103.0	15000	16.3	2360	51.7	7500	13.1	1900
	12%	158.0	23000	18.7	2720	81.3	11800	18.7	2720
S2	Green	86.1	12500	14.2	2060	43.4	6300	11.0	1600
	12%	134.0	19500	16.3	2360	71.0	10300	16.7	2430
S3	Green	73.0	10600	12.4	1800	36.5	5300	9.09	1320
	12%	114.0	16500	14.2	2060	62.0	9000	15.0	2180
S4	Green	62.0	9000	10.7	1550	31.0	4500	7.72	1120
	12%	93.7	13600	12.4	1800	53.4	7750	13.1	1900
S5	Green	51.7	7500	9.1	1320	25.8	3750	6.54	950
	12%	79.2	11500	10.7	1550	46.2	6700	11.7	1700
S6	Green	43.4	6300	7.92	1150	21.7	3150	5.51	800
	12%	67.2	9750	9.10	1320	40.0	5800	10.3	1500
S7	Green	36.5	5300	6.89	1000	18.3	2650	14.62	670
	12%	56.8	8250	7.92	1150	34.4	5000	9.09	1320

*** Green :** ***Estado verde***

TABLE 3 ***CUADRO 3***

SHRINKAGE CLASSIFICATION

CLASIFICACION DE CONTRACCION

Code Number *Número clave*	Shrinkage (%) *Contracción (%)*			
	Tangential *Tangencial*		Radial *Radial*	
	Green to Oven-dry *Verde a seco horno*	Green to 12% m.c.* *Verde a 12% CH+*	Green to Oven-dry *Verde a seco horno*	Green to 12% m.c.* *Verde a 12% CH+*
1	0 - 3.5	0 - 2.5	0 - 2.0	0 - 1.0
2	3.6 - 5.0	2.6 - 4.0	2.1 - 3.0	1.1 - 2.0
3	5.1 - 6.5	4.1 - 5.5	3.1 - 4.0	2.1 - 3.0
4	6.6 - 8.0	5.6 - 7.0	4.1 - 5.0	3.1 - 4.0
5	>8.1	>7.1	>5.1	>4.1

*** Moisture content**

+ Contenido de humedad

TABLE 4 ***CUADRO 4***

NATURAL DURABILITY CLASSIFICATION*

CLASIFICACION DE DURABILIDAD NATURAL+

Durability Class *Clase de durabilidad*	Approximate life in contact with the ground (years) *Vida aproximada de maderas en contacto con el suelo (años)*
1	more than 25 *más de*
2	to 15 20 *a*
3	to 8 15 *a*
4	to 1 8 *a*

*** For conditions significantly different from that represented by ground contact, the life expectancies of the species would obviously be much longer than that indicated in this classification.**

+ Para condiciones significativamente diferentes a las presentadas por el contacto directo con el suelo, la expectativa de vida de las especies sería obviamente mayor que La indicada en esta clasificación.

TABLE 5 ***CUADRO 5***

TIMBER USES CODE

CODIGO PARA USOS DE MADERAS

1. **Structural timber (heavy)**
   Madera estructural (pesada)
2. **Structural timber (light)**
   Madera estructural (liviana)
3. **Flooring (heavy)**
   Piso (industrial)
4. **Flooring (light)**
   Piso (vivienda)
5. **Mine timber**
   Madera para minas
6. **Ship and boat building**
   Construcción de buques y barcas
7. **Vehicle body**
   Carrocería
8. **Furniture, cabinet work**
   Muebles, ebanistería
9. **Handles, ladders**
   Mangos, escaleras portátiles
10. **Sporting goods**
    Artículos deportivos
11. **Agricultural implements**
    Utensilios agrícolas
12. **Veneer, plywood**
    Chapas, terciadas
13. **Pulpwood**
    Pulpa
14. **Musical instruments**
    Instrumentos musicales
15. **Boxes, crates**
    Cajas, embalajes
16. **Precision equipment**
    Equipo de precisión
17. **Interior trim**
    Molduras interiores
18. **Blockboard**
    Tablero con capa interior de latas
19. **Matches**
    Fósforos
20. **Joinery**
    Carpintería
21. **Sleepers**
    Durmientes
22. **Hardboard, particle board**
    Tablero duro, aglomerado
23. **Poles, piles**
    Postes, pilotes
24. **Carvings**
    Tallado
25. **Vats**
    Cubas
26. **Battery separators**
    Separadores de acumuladores
27. **Toys and novelties**
    Juguetes y fantasías
28. **Turnery**
    Tornería
29. **Wood-wool**
    Lana de madera
30. **Draining boards**
    Escurridores
31. **Food containers**
    Receptáculos de comestibles
32. **Pattern making**
    Fabricar de modelos

LIST OF COUNTRIES AND MAP OF SOUTH AMERICA

LISTA DE PAISES Y MAPA DE AMERICA DEL SUR

LIST OF COUNTRIES MENTIONED IN TEXT - (*LISTA DE PAISES MENCIONADOS EN EL TEXTO*)

1. Brazil (*Brasil*)
2. Argentina
3. Bolivia
4. Paraguay
5. Uruguay
6. Peru (*Perú*)
7. Ecuador
8. Colombia
9. Venezuela
10. Chile
11. Guyana (*Guayana*)
12. Surinam
13. French Guiana (*Guayana Francesa*)
14. Malagasy (*República Malgacha*)
15. Honduras
16. Uganda
17. Nicaragua
18. Ghana
19. Tanzania
20. South Africa (*Sudáfrica*)
21. Guatemala
22. Zaire (Rep. Dem. del Congo)
23. Puerto Rico
24. United States of America (*Estados Unidos de América*)
25. Trinidad
26. Panama (*Panamá*)
27. Costa Rica
28. United Kingdom (*Reino Unido*)
29. West Indies (*Antillas*)
30. Central America (*América Central*)
31. Congo-Brazzaville
32. Central African Republic (*República Africana Central*)
33. Ivory Coast (*Costa de Marfil*)
34. Cameroon (*Camerún*)
35. Sudan (*Sudán*)
36. Malaysia (*Malasia*)
37. Mexico (*México*)
38. Gabon (*Gabón*)
39. Guinea
40. Australia
41. Jamaica
42. Indochina
43. Fiji
44. Hawaii
45. Philippines (*Filipinas*)
46. Guadeloupe (*Guadalupe*)
47. Burma (*Birmania*)
48. Dahomey

MAP OF SOUTH AMERICA

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SPECIES DESCRIPTIONS

DESCRIPCIONES DE ESPECIES

Acacia melanoxylon (H) **Family:- *Mimosaceae***

(BLACK-WOOD) (EXOTIC)

Description: Sapwood is white and may be up to 100mm (4 in.) wide. Heartwood varies from pale grey to dark brown or black. Growth rings distinct. Texture medium and even. Grain usually straight, but may be slightly interlocked or wavy. Occasional specimens show an attractive fiddleback figure. Tree is native to Australia, where it grows on a wide range of soils. In Argentina, an 18 year-old plantation was reported to have a mean height of approximately 18m (60 feet). Boles are reasonably straight. Tree tolerates cold temperatures but is not drought-resistant; thrives in montane areas where it grows slowly in the early stages. Often planted as a wind-break.

Characteristics: Logs may split in storage and boards tend to split when sawn. Timber air-dries or kiln-seasons fairly well with moderate degrade. Stock works fairly well with most hand and machine tools. Cross-grain may cause roughness in planing, and a cutting angle of 20° is advisable to produce smooth surfaces. Finishes and polishes well, glues satisfactorily but nails poorly. Timber reported to be susceptible to *Anobium* and termite attack. Sapwood moderately resistant, heartwood fairly resistant to impregnation. Steam bending properties good. Timber has good impact properties. Makes good fuel. Dust may cause dermatitis and asthma in some workers.

References: 8, 18, 19, 22, 34, 36, 43, 87, 107, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.9 (3)	10 20 40 (Native)	7+ 8 7+	S3 S4 S4	2-3	3	S	3,4,6,7,8, 10,11,12, 14,16,17, 20,21,22, 23,24,25, 27,28,31

Achras zapota ***(H)*** **Family:-** ***Sapotaaeae***

(Syn: Sapota achras)

(ZAPOTA, SAPODILLA)

Description: Sapwood is pale pinkish, merging gradually into the red or reddish-brown heartwood. Lustre low. Grain mostly straight. Texture moderately fine. Bole 8-10m (26-33 feet) long, symmetrical. An evergreen tree of uncertain range as native species but planted throughout the tropics. Species prefers calcareous soils. Bark contains latex.

Characteristics: Timber is very hard and heavy, tough and strong. A difficult material to dry because of its marked tendency to distort, split and check. Not very easy to work, but with proper care stock planes to a good surface. Finishes well and drills cleanly. Material cannot be nailed unless pre-bored. Turns quite well. Timber has very high strength values, especially in bending, compression and shock resistance. Reported to be very resistant to insect attack and fairly resistant to marine borers. The resinous latex is used for making chewing-gum, statuettes, etc. Fruits are edible.

References: 1, 13, 19, 20, 27, 36, 47, 55, 83, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23-27 (75-90)	1.5 (5)	37 17,9	9+ 10	S3	4-5	1	S	1,3,4,5, 6,9,20, 21,23,28

Albizia caribaea **(H)** **Family:- *Mimosaceae***

(CARBALI, TANTAKAYO)

Description: Sapwood 75 to 100mm (3-4 in) wide, white to cream in colour and not sharply differentiated from the pale yellow heartwood. Lustre medium, grain usually straight, occasionally interlocked. Texture rather coarse, uniform. Growth rings not distinct. Bole clear length is usually about 10m (33 feet). Species occurs in monsoon forests.

Characteristics: Timber air-seasons fairly rapidly but with a tendency to check and warp. Should not be dried too fast. Wood is moderately difficult to work but machines to a generally smooth surface except for some tearing on quartered surfaces due to interlocked grain. Finishes well if filler used. Probably resistant to termite attack. Sapwood moderately resistant, heartwood extremely resistant to preservative treatment. Good weathering properties. Fairly stable in service. Rated only fair in steam bending. Would make good box-wood and fuel. Dust may cause irritation to nose and throat.

References: 36, 76, 78, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27 (90)	0.9 (3)	9	8+	S4	3-4	2	S	1,2,3,4, 5,6,7,8,9, 20,21,23, 28

Alexa imperatricis (H) **Family:-** ***Papilionaceae***

(HAIARI)

Description: Sapwood 65mm (2 ½ in) wide, white or grey in colour and not readily demarcated. Heartwood is whitish to brownish-yellow occasionally somewhat darker. Lustre medium to low. Odour and taste indistinct. Grain generally straight, texture rather coarse. Growth rings not distinct. Bole unbuttressed, straight, cylindrical and often 15 to 20m (50-65 ft) in length. Species is found in rain forests.

Characteristic: Logs are reported to split easily after felling. Timber has marked tendency to collapse during seasoning. Careful stacking for air-seasoning and the use of high humidities and low temperatures during the early stages of kiln-drying are recommended for better results. Timber works easily but does not finish very smoothly. It takes nails easily and glues satisfactorily. Peels and slices well. Weathering properties poor. Timber is very susceptible to termites, pinhole borers and other insects.

References: 1, 27, 38, 49, 70, 148.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.9 (3)	9	7	S6	3-5	4	S	2,8,12, 15,17,20

Amburana cearensis **(H)** **Family: *Papilionaceae***

(Syn: *Torresea cearensis*)

(AMBURANA)

Description: Sapwood grey or oatmeal coloured, not sharply demarcated from the heartwood which is yellowish or very light brown, sometimes with reddish hue and conspicuous vessel lines. Lustre moderate to high; appears oily. Wood has distinct odour and characteristic taste of cumarin or vanilla. Texture coarse and uneven. Grain is diagonal. Bark contains resin which has a fragrant volatile oil. Bole is usually straight and 10 to 15m(33-50 ft) in length. Species prefers deep sandy-clay soils in humid areas.

Characteristics: Timber converts easily but green stock often produces woolly surface. It has a tendency to warp if not dried carefully. Works easily with machine and hand tools, and finishes very smoothly. Liable to insect attack. Moderately resistant to impregnation with preservatives. Suitable for slicing. Glues well. Stable when manufactured. Oil is used for medicinal purposes.

References: 1, 6, 20, 26, 27.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20 (65)	0.7 (2¼)	1 2	7+ 7	S5 S5	2-3	3	(S)	2,4,7,8, 12,15,17, 20,25

Anacardium excelsum (H) **Family:- *Anacardiaceae***

(Syn: *A. rhinocarpus*)

(ESPAVE)

Description: Sapwood is 150 to 250mm (6-10 inches) wide and greyish-white with pinkish tinge in colour. Freshly cut heartwood is light yellowish to reddish-brown, often with a greenish hue, darkening to a fairly uniform light russet-brown with a golden or reddish hue. Both sap and heartwood are fairly lustrous and attractively marked by prominent vessel lines. Grain interlocked, showing a coarse ribbon stripe figure on quarter-sawn surfaces. Texture medium. Odour and taste not distinct. Trunks are swollen up to 0.9 to 2.4m (3-8 feet) above the ground, but buttresses are not well developed. Clear boles range from 10 to 18m (33-60 feet) in length. Species is found in lowland rain forest, on level plains as well as in dense evergreen forest. Prefers lower, well-drained soils. Gregarious in some areas.

Characteristics: Timber is moderately difficult to air-season with a variable drying rate. Should be seasoned slowly to minimize degrade such as warping and checking. Stock works easily, has good shaping and mortising properties. Turns and bores fairly well, but has poor planing and sanding characteristics. Chipped grain and woolly surfaces are the most common machining defects. However, stock polishes well with a filler and stains readily. Takes nails well. Resistant to termites but prone to pinhole borer attack. Permeable to moderately resistant to preservative treatment. Weathering properties good. A potential peeling timber. Used for cheap furniture. Dust may cause dermatitis and asthma.

References: 1, 5, 10, 35, 55, 66, 76, 78, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23-45	0.9-1.5	9	6+	S7 (Below)	2-3	3-4	S	2,8,12, 15,17,20, 31
(75-150)	(3-5)	8 26	5+ 7	S7 S7				

Andira inermis (H)

Family:- *Fabaceae* (Formerly *Papilionaceae*)

(ANGELIN, MOCA)

Description: Sapwood is pale brown to greyish-yellow and well defined from the yellowish-brown to dark reddish-brown heartwood. Sometimes highly figured. Lustre rather low. Grain is straight to slightly irregular. Texture very coarse and uneven. Siliceous. Odour and taste not distinct. Pores containgum deposits. Boles are moderately well-formed, unbuttressed and up to 21m(70 feet) in length. Occurs generally in swamp and marsh forest. Species has been planted for ornamental and shade purposes.

Characteristics: Timber is moderately to extremely hard, heavy, tough and strong. Air-seasons at moderate rate without serious degrade. However, the sapwood is very susceptible to sap stain fungi during the early stages of drying. Defects occurring during kiln-drying are slight. Stock saws and works moderately well with both hand and machine tools and can be finished to a good surface. In planing, raised grain may occur when dull knives are used. Turns well and glues satisfactorily. Staining and polishing properties good. Takes nails and screws well. Sapwood often attacked by pinhole borer. Timber moderately resistant to termite and marine borer attack. Not very stable. Highly durable in fresh water. Bark and seeds, reportedly poisonous and in large doses causing death, have been used as a vermifuge, purgative and narcotic.

References: 1, 10, 17, 23, 27, 35, 38, 45, 47, 49, 50, 55, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.8-1.2 (2½-4)	29	8+	S3	3-4	2	S	1,3,4,5, 6,7,8,9, 10,12,17, 20,21,23, 24,28.

Aniba ovalifolia *(H)* **Family:- *Lauraceae***

(YELLOW SILVERBALLI)

Description: Sapwood oatmeal coloured, well defined. Heartwood golden-brown or brownish-yellow, turning dark brown with age. Lustrous. Texture fairly fine and even. Grain normally straight. Taste spicy, and a characteristic aromatic scent is present. Bole is unbuttressed and cylindrical, 12 to 18m (40-60 feet) long. Rare to occasional in dry evergreen and rain forests. Bark contains a small proportion of tannin.

Characteristics: Timber air-seasons well with little degrade, but subject to very superficial surface checking. Works easily and well with hand and machine tools. In drilling, exit of tool must be well supported to prevent tearing. Turns well and takes a high satiny sheen on planing. Finishes smoothly and polishes well. Species is very resistant to termite attack. An excellent bending timber. Should peel and slice well.

References: 49, 51, 66, 74.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-27 (80-90)	0.5-0.6 (1½-2)	11	7+	S6	(4)	2-3	(N)	2,6,8,12, 17,20,28

Apeiba tibourbou (H) **Family:- *Tiliaceae***

(CORCHO)

Description: Timber is whitish, pale yellow or slightly greyish in colour, sometimes with a pinkish or greenish tint showing little difference between sapwood. and heartwood. Moderately lustrous. Odour and taste not distinct. Grain straight, texture moderately-coarse to coarse. Growth rings indistinct. Vascular lines clearly visible, being darker than the fibrous tissue. Bole cylindrical and clear to a length of about 14m (46 feet) with small buttresses up to 0.6 or 0.9m (2-3 feet) high.

Characteristics: Timber is light and soft. It air-seasons easily, saws readily but requires sharp edges to cut smoothly across grain. Due to its abundant parenchymatous tissue, the timber planes unevenly and polishes with difficulty. Takes nails and screws easily but holding power not satisfactory. Suitable for insulating panels. Used as firewood. Flowers are used for medicinal purposes.

References: 1, 33, 79, 184.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
29 (95)	0.4 (1¼)	8	4	S7 (Below)	2-4	4	S	12,15,18, 31

Apuleia molaris (H) Family:- *Caesalpiniaceae*

(Syn: *A. ferrea*)

(MUIRA-JUBA, FERRO)

Description: Sapwood is narrow, whitish and sharply demarcated from the reddish or brownish heartwood. No taste but a slightly rancid odour is present in some specimens. Texture fine. Grain interlocked producing a mild stripe figure on radial surface. Rather lustrous. Bole usually 12 to 15m (40-50 feet) long. Species reaches its best and is most commonly found on rich, moist but well-drained clay soils. Occurs in mixed hardwood forests.

Characteristics: Timber is very hard, tough and strong. Air-dries moderately fast with very little checking and warping. Works well with most tools. Turns and carves easily. Finishes smoothly. Polishes and glues well. Reported to be very resistant to marine borers. Weathering characteristics excellent. Bark is used for tanning.

References: 1, 9, 20, 27, 76, 78, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
38 (125)	0.6-0.8 (2-2½)	1	9+	S2	4	2	(S)	1,3,4,5, 8,9,11, 17,20,21, 23,28

Araucaria angustifolia **(S)**
(Syn. *A. brasiliana*)

Family:- *Araucariaceae*

(PARANA PINE, BRAZILIAN PINE)

Description: Sapwood is yellowish and not always distinct from the heartwood, which is very light brown, often with bright red streaks. Texture fine and even. Grain straight. No distinct odour and taste. Growth rings evident, but without prominent alternating bands of early- and late-wood. Bole is clear, straight, cylindrical and 25 to 30m (82-100 feet) in length. Species is found at altitudes varying between 600 and 1800m (2000-6000 feet). Occurs generally in dense forests mixed with rain-forest species or in park-like forests, sometimes in almost pure stands. Gregarious. Prefers deep, rich and well-drained soils. Natural regeneration poor. Has been planted as an ornamental tree. A fast-growing species, suitable for afforestation.

Characteristics: Timber must be seasoned with care, particularly the darker material which dries slowly and is liable to split and warp. Owing to inherent stresses in the timber, it is inclined to distort when re-sawn. Works easily with hand and machine tools and has very little dulling effect on cutting edges. It planes and moulds to a clean, smooth finish and gives good results in most other operations. Nailing, screwing and gluing properties are very good. Stains, paints and varnishes well. Sapwood is prone to blue stain. Occasional damage by pinhole borers may occur. Susceptible to termite and marine borer attack. Sapwood permeable to preservative treatment, heartwood moderately resistant. Peels well. Moderately stable in use. Suitable for pulp and paper-making. Fruit is edible. Timber is soft, moderately strong and light.

References: 1, 2, 3, 4, 5, 6, 7, 9, 11, 14, 20, 30, 36, 47, 53, 64, 66, 91, 96, 104.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
45	0.9-1.5	1	7	S5	3-4	4	N	2,4,7,8, 12,13,14, 15,17,18, 19,20,22, 25,29,30, 31
(150)	(3-5)	2	6+	S6				

Araucaria araucana (S) **Family:- *Araucariaceae***

(CHILE PINE, PEHUEN)

Description: Sapwood and heartwood not clearly demarcated. Wood is pale yellowish or greyish-yellow in colour, sometimes with slightly darker stripes. Texture fine and uniform. Grain usually straight. Growth rings not well-demarcated. No odour or taste. Bark contains resin. Boles from forest-grown trees are unbranched up to lengths of 18 to 27m (60-90 feet), straight and cylindrical. Species grows mostly on soils of volcanic origin which are often dry and stony. Occurs in pure stands or in small groups mixed with other species at altitudes between 900 to 1800m (3000-6000 feet). Regenerates well. Specimens more than 500 years old are frequently found. Commonly used as an ornamental tree. Suitable for plantations within its natural habitat.

Characteristics: Timber is somewhat difficult to season, dries slowly and rather unevenly. Has good working properties and takes an excellent polish. Presents only a small blunting effect on cutting edges. Cuts cleanly in most operations but has a tendency to crumble when worked on end grain. Takes nails well. Varnishes and paints satisfactorily. Glues, peels and slices well. Heartwood probably moderately resistant to preservative treatment, sapwood permeable. Suitable for pulping and moderately good for fuel. Resin is used medicinally and the seeds are used for food. A good substitute for WHITE BALTIC (*Picea abies*).

References: 1, 4, 6, 13, 36, 47, 67, 88, 91, 94, 110, 119.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-40	0.9-1.5	2	7+	S5	4-5	4	N	2,4,8,12, 13,15,17, 19,20,22, 29,30,31
(90-130)	(3-5)	10	6+	S6				

Aspidosperma dugandii (H) **Family: *Apocynaceae***

(CARRETO)

Description: Sapwood is dull greyish-white, not sharply demarcated from the heartwood which is yellowish to brown-yellow with pink to violet stripes. Moderately lustrous. No odour, bitter taste. Texture fine and uniform. Grain straight. Boles are generally straight.

Characteristics: Timber is moderately difficult to air-season. Should be dried slowly to avoid surface checking and warping. Works moderately well with both machine/hand tools. Planes easily and finishes smoothly unless interlocked grain is present. Takes a high polish and does not require sanding if grain is straight. Does not take nails and screws easily but holds them well. Timber is resistant to insect attack. Highly resistant to acid. Not very stable. Dust may cause respiratory and skin diseases, unless careful ventilation adopted.

References: 1, 27, 33.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-20 (50-65)	0.4 (1¼)	8	9+	S2	2-3	(2-3)	(S)	1,2,3,4, 5,6,9,10, 20,25,28

Aspidosperma peroba (H) **Family:- *Apocynaceae***

(Syn: *A. polyneuron*)

(PEROBA ROSA)

Description: Sapwood is white or yellowish, merging gradually into the heartwood which is rose-red when freshly cut, often streaked with purple or brown and turning brownish-yellow to uniformly brown on exposure. Not lustrous. Texture fine and even. Grain straight, crossed or wavy. Odour not distinct, taste rather bitter. Bole slender, straight, well formed and up to 25m (82 feet) in length. Species is found in mixed hardwood forests, often in small groups.

Characteristics: Timber dries with little splitting or checking, but some distortion may develop. Must be dried carefully. Works moderately easily with hand and machine tools, causing a moderate blunting effect on cutting edges. Resistance to cutting is medium. In planing, a cutting angle of 200 will overcome tearing and produce a good finish. In boring and mortising, tool should be supported to minimize edge-chipping. Stains and polishes well. Glues satisfactorily. Damage by pinhole borers and long-horn beetles is sometimes present. Liable to termite attack. Heartwood extremely resistant to preservative treatment, sapwood permeable. Timber is resistant to wear and tear and can be sliced for decorative veneer. Dust may cause skin irritation. Good fuel.

References: 1, 3, 5, 6, 8, 9, 11, 20, 27, 43, 47, 53, 61, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-38	0.8-1.2	1	8+	S3	3-4	1	S	1,3,4,5, 6,7,8,9, 12,17,20, 21,23,25, 28
(50-125)	2¼-4	2	8+	S4				

Aspidosperma quebracho-blanco (H) **Family:-** ***Apocynaceae***

(QUEBRACHO BLANCO)

Description: Sapwood poorly defined from the heartwood which is yellow-ochre to rosein colour, sometimes orange to rose, fading with age. Lustre medium. Slightly figured. Texture fine and even. Grain irregular to interlocked. No characteristic odour or taste. Bole up to 12m (40 feet) long, moderately straight and well formed. Species grows on dry sandy soils. Natural regeneration good.

Characteristics: Timber is strong, heavy, hard, tough and resilient. Rather difficult to season. Care must be taken to prevent warping and checking especially in board form. It is rather difficult to work with machine and hand tools but finishes smoothly. Turns well. Not susceptible to pinhole borer attack. Resistant to moderately resistant to preservative treatment. Good steam bending properties. Makes excellent firewood but it is commonly used for charcoal. Timber is source of tannin extract.

References: 1, 4, 6, 20, 27, 47, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20 (65)	0.8 (2½)	2	8	S5	4-5	2-3	(S)	1,2,3,4, 5,7,8,17, 20,21,23, 25,28

Astronium balansae **(H)** **Family:- *Anacardiaceae***

(URUNDAY)

Description: Sapwood 30 to 40mm (1¼ - 1½ inches) wide, yellowish and well defined. Heartwood is pale to dark grey when fresh, turning to dark brown on exposure with dark stripes. Texture fine and even. Grain is wavy, sometimes interlocked. Lustre is low. Odour and taste absent. Wood contains about 16% of tannin. Boles are 10 to 15m (33-50 feet) long, straight and well formed. Species is found in wet forests, often in mixed stands or in small groups. It prefers sandy and well-drained soils. Natural regeneration poor.

Characteristics: After conversion timber must be stored in a shady place, to avoid excessive splitting. Must be seasoned with care. Working properties variable. Finishes well. Difficult to nail and pre-boring necessary for good results. Weathering properties rather poor. Very durable in fresh-water. Not usually given a preservative treatment. Makes good firewood and charcoal. Timber is source of tannin extract.

References: 1, 4, 6, 20.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25 (82)	0.7 (2¼)	2	10	S2	5	1-2	(S)	1,2,3,4, 5,7,8,11, 17,20,21, 23,28

Astronium fraxinifolium **(H)** **Family:- *Anacardiaceae***

(GONCALO ALVES)

Description: Sapwood greyish in colour, sharply defined from the heartwood which is light to dark brown or reddish with uniformly distributed black stripes. Grain straight or wavy. Texture rather fine. Odour and taste not distinct. Sometimes mottled figure present. Boles up to 15m (50 feet) in length, straight and cylindrical. Species is scattered in the coastal mountain forests and mixed hardwood formations.

Characteristics: Timber is hard, strong, stiff and heavy. Although moderately difficult to season, it dries at a moderate rate with some warping and slight checking. Fairly difficult to work with severe blunting effect on cutting edges and marked resistance to cutting. Finishes smoothly and takes a high polish. Turns and carves well. Gluing may present some difficulties. Highly resistant to fungal attack. Can be sliced to produce highly decorative veneer. Good wearing properties.

References: 1, 3, 7, 9, 20, 61, 92, 96.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-0.9 (2-3)	1	10	S2	4-5	1	(S)	1,2,3,4, 5,7,8,9, 10,12,14, 17,20,21, 23,24,27, 28

Astronium graveolens **(H)** **Family:- *Anacardiaceae***

(GATEADO)

Description: Sapwood 50 to 100mm (2-4 inches) wide, greyish-white and well defined. Heartwood is brown to deep mahogany red-brown with dark brown or black irregular markings. Often highly figured. Grain is straight to interlocked, occasionally wavy. Texture moderately fine and even. Bole only slightly buttressed, generally straight, cylindrical and up to 15m (50 feet) long. Species is common in upland forests.

Characteristics: Timber has practically identical properties with GONCALO ALVES (*Astronium fraxinifolium*). It air-seasons moderately rapidly but care is needed to avoid excessive checking and warping. Not difficult to work in spite of its high density, but hard to saw. However, it finishes smoothly, turns readily and takes a high polish. Heartwood is extremely resistant to preservative treatment. Good wearing and weathering characteristics. Can be sliced for veneer, but reported to present some difficulty in gluing. Suitable for insulator pins and other specialty uses of BLACK LOCUST (*Robinia pseudoacacia*).

References: 1, 2, 5, 20, 21, 31, 55, 76, 77, 92, 95.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30	0.9	1	9+	S2	5	1	(S)	1,2,3,4, 5,7,8,9, 10,12,17, 20,21,23, 28
(100)	(3)	9	10	S2				
		15	9+	S3				

Astronium urundeuva **(H)** **Family:** ***Anacardiaceae***

(ORENDEUVA)

Description: Sapwood is yellow-pink, about 30mm (1¼ inches) wide, and sharply demarcated from the heartwood which is brown-pink to somewhat violet when fresh, turning to reddish-brown upon exposure. Often slightly streaked. Texture is fine and uneven. Grain is wavy sometimes interlocked. Odour and taste not distinct. Growth rings not clearly defined. Wood contains about 15% of tannin. Bole is straight and may have a clear length up to 12m (40 feet). Species is found in mixed hardwood forests.

Characteristics: Timber is very hard, heavy, stiff and strong. Care must be taken in seasoning to avoid excessive warping, especially in thin boards. Difficult to work with all tools but finishes well. Pre-boring necessary for nailing and screwing. Very difficult to split. Weathering properties very good. Very resistant to insect attack. Makes very good firewood and charcoal. Can be a good source of tannin extract.

References: 1, 6, 9, 20, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18 (60)	0.8 (2½)	1 2	10+ 10	S1 S1	3-4	1	(S)	1,2,3,4,5, 6,7,9,17, 20,21,23, 28

Avicennia germinans (H) **Family:- *Avicenniaceae***

(Syn: *A. marina*)

(PARWA, BLACK MANGROVE)

Description: Sapwood is wide, yellowish-grey or brown-yellow and not always sharply demarcated from the narrow heartwood which is dark yellow-brown to very dark brown in colour. Lustre low. Odour and taste not distinct. Grain irregular, generally interlocked. Texture coarse and uneven. Distinct growing zones appear as stripes on longitudinal surface. Yellowish, attractive, lapachol compound may be present. Bole 6 to 12m(20-40 feet) long, unbuttressed but basally swollen with numerous pneumatophores. Species grows in pure, dense stands on mudflats along the coast and estuaries, in brackish coastal swamps and on river banks along the brackish lower courses of the rivers.

Characteristics: Timber is not easy to work but saws reasonably well. Air-seasons rather easily, but when kiln-dried a slow schedule must be used to prevent deformations. May present some difficulties in planing owing to interlocked grain. Gluing properties good. Splits on nailing and screwing, pre-boring necessary. Moisture movement high. Very susceptible to termite and marine borer attack. Resistance to impregnation variable. Timber is mostly used in the round. Can be pulped satisfactorily by soda process. Makes good fuel and charcoal. Bark yields tannin.

References: 1, 20, 44, 49, 50, 70, 87, 100, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20	0.3-0.5	12	9	S3	5	4	S	2,13, 21, 23,25
(65)	(1-1½)	9	8+	S3				

Bagassa guianensis **(H)** **Family:- *Moraceae***

(BAGASSE, TATAJUBA)

Description: Sapwood is narrow, sharply demarcated from the heartwood and pale yellow to yellowish-white in colour. Heartwood is yellow when freshly cut, often with brown streaks, turning to golden-brown to russet after seasoning. Lustrous. Grain usually interlocked resulting in a rather broad streaky figure on quarter-sawn surface. Texture medium to coarse, moderately uniform. Growth rings indistinct. Odour and taste not evident when seasoned. Bark yields large quantities of sweet, sticky latex on cutting. Bole is well formed and may be up to 25m (82 feet) in length. Species is found generally scattered in the low upland forests.

Characteristics: Timber seasons at a moderate rate without checking and only a slight tendency to warp. It saws and works easily and finishes smoothly. Has very good dimensional stability. Moderately resistant to marine borer attack. Heartwood highly resistant to preservative treatment. Weathering characteristics poor. Wood is very resilient. Fruits are edible.

References: 1, 27, 38, 76, 77, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
33 (110)	0.8 (2½)	1 11	9 8+	S2 S1	4-5	1	(N)	1,2,3, 4,6, 8,10, 17,20, 23,28

Balfourodendron riedelianum (H) **Family:- *Rutaceae***

(PAU MARFIM, GUATAMBU)

Description: Sapwood not well demarcated from the heartwood. Wood is nearly white to yellow and marked with fine dark streaks. Lustrous. Grain straight. Texture fine and uniform. Growth rings distinct. Odour not distinct, taste slightly bitter. Bole usually straight with a clear length of 10 to 12m (33-40 feet). Species is found in mixed hardwood forests.

Characteristics: Timber is tough, strong, hard and fairly heavy. In seasoning, there is no great tendency to warp but bad end checking may occur if dried rapidly. Not difficult to work. Finishes smoothly and takes an excellent polish. Glues well. Has great flexibility but splits readily. Could, be good substitute for EUROPEAN BOXWOOD (Buxus sempervirens) for some purposes. Liable to blue stain. Dust may cause irritation to nose and throat.

References: 1, 2, 6, 16, 20, 37, 53, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20-25	0.6	1	9	S3	4-5	3-4	S	1,2,3, 6,7,9, 10,11, 12,14, 16,17, 20,24, 27,28
(65-82)	(2)	2	8+	S3				

Bertholletia excelsa (H) **Family:- *Lecythidaceae***

(BRAZIL-NUT)

Description: Sapwood 75 to 100mm (3-4 inches) wide, pale yellowish-brown and sharply demarcated. Heartwood is uniform pinkish-brown when first cut, turning light chestnut-brown on exposure. Lustre medium. Grain typically interlocked, often showing a ribbon-like figure on quarter-cut surfaces. Texture rather coarse. Concentric bands of parenchyma give the appearance of growth rings on back-cut surface. Odour and taste absent. Growth stresses often cause log ends to split immediately after cross-cutting. Some trees contain more gummy cells than others. Bole is well formed and clear of branches up to 30m (l00 feet) in length. Species is commonly found on well-drained clayish or sandy-clay soils.

Characteristics: Timber air-seasons easily, drying at a fast to moderate rate with only slight checking and warping, and a minimum of casehardening. Moderately difficult to work but finishes smoothly. Exudations of gum tend to build up on saw teeth particularly when stock is green. Glues readily. Heartwood extremely resistant to impregnation. Good weathering and steam bending properties. Tension wood and gum may cause some degrade in veneer production. The fibrous inner bark is used for tow and rope making. Kernels are used for domestic and industrial purposes.

References: 1, 20, 46, 76, 78.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
48 (160)	0.9-1.2 (3-4)	1	8	S5	3-5	1-2	(S)	1,2,3,4,6,8,12,17,20,21,23,25

Bombacopsis quinata (H) **Family:-** ***Bombacaceae***

(CEDRO ESPINO, SAQUI-SAQUI)

Description: Sapwood is yellowish to white in colour. Heartwood is uniform pale pinkish or pinkish-brown when freshly cut, darkening to reddish or reddish-brown on exposure. Lustre medium to high. Grain straight to interlocked. Texture medium. Growth rings indistinct. Odour absent, taste slightly astringent. Gum ducts occasionally present. Bole is usually short and often not well formed. Buttresses present. Species is common in open forests. Grows on well-drained, often gravelly soils on the upper slopes of low hills and ridges. Prefers semi-dry areas of habitat.

Characteristics: Timber air-seasons very slowly with slight checking and warping. Kiln-dries satisfactorily with a reasonably short drying schedule. Works readily with all hand and machine tools and finishes smoothly. Liable to sapstain and termite attack, but resistant to teredos. Sapwood permeable to impregnation. Weathering properties fair. Timber does not appear to be suitable for steam bending. Fire resistant. Used for tanning and rum storage vats.

References: 1, 20, 66, 76, 77, 83, 127.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.9 (3)	15 26 9	8 6+ 6	S5 S7 S7	3	3-4	S	2,8,12, 15,17,20, 25,28

Bombacopsis sepium (H) **Family:- *Bombacaceae***

(HABILLA)

Description: Sapwood pale grey, clearly demarcated from the reddish-brown heartwood. Lustre medium to high. Odour not distinct, taste slightly astringent. Grain straight to slightly interlocked, texture medium. Wood contains a hygroscopic gum. Bole usually not cylindrical, generally with buttresses up to 2m (7 feet) high. Species is found in rain forests.

Characteristics: Timber air-seasons slowly with little degrade but is prone to blue stain. Reported to kiln-dry rapidly and well. Works easily with hand and machine tools. Planes to a good surface and polishes satisfactorily. Turns and carves well. Degree of insect attack is apparently related to gum content. Timber is corrosive to iron compounds. Suitable for veneer.

References: 1, 83, 149.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
35 (115)	2 (7)	9	6	S7	2-3	4	S	2,8,12, 15,17, 20, 25,28

Bowdichia virgilioides (H) **Family:-** ***Papilionaceae***

(SAPUPIRA)

Description: Sapwood is narrow, almost white in colour and sharply demarcated from the heartwood, which is brown to reddish-brown. Lighter yellowish parenchyma may appear as veins in planing. Lustre low. Growth rings not visible. Texture coarse and uneven. Grain rarely straight, usually cross or wavy. No distinct odour and taste present. Bole generally straight and well-formed, up to 20m (65 feet) in length. Species is found in rain and savanna forests.

Characteristics: Timber is hard, strong, stiff and fairly heavy. Stock must be dried slowly to prevent the tendency to distort if dried fast. Not easy to work with hand tools, particularly if cross grain is present. Can be planed to a good surface if low cutting angle is used. Rather difficult to nail, but nailing and screw-holding characteristics good. Finishes smoothly and takes a high polish. Stains and glues well. Very resistant to insect attack. A good joinery timber. Stock usually sliced for veneer production. Suitable for use in the round.

References: 1, 8, 9, 20, 35, 70.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	1.2 (14)	1	9+	S1	5	1	(N)	1,2,3,4, 5,6,7,8, 9,12,17, 20,21,23, 28

Brosimum paraense **(H)** **Family:-** ***Moraceae***

(Syn: ***Ferolia guianensis*****)**

(SATINE, DUKALIBALLI)

Description: Sapwood about 40mm (1½ inches) wide, pale yellowish-white or pinkish-yellow. Heartwood is yellowish, red-brown or rich chestnut brown with high satiny lustre and occasionally darker streaks. Texture rather fine. No odour or taste. Latex tubes common. Lumina contains red-brown gummy substance. Growth rings not distinct. Grain usually straight or wavy. Trunk is buttressed up to 2.4m (8 feet) high. Bole is cylindrical, 15 to 21m (50-70 feet) long. Species occurs in upland rain forests, frequently on sandy soils.

Characteristics: Timber is very hard, tough, and strong. Seasons without difficulty but must be dried carefully. Moisture movement low. Works with some difficulty due to its hardness and density. Turns well. Finishes smoothly and polishes excellently. Glues well. Difficult to nail without preboring. Timber is very durable and highly resistant to termites. Suitable for tool handles.

References: 1, 20, 44, 47, 49, 50, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-36 (90-120)	0.5-0.7 (1½ - 2¼)	12	9+	(S2)	4	1	(S)	1,2,3,4, 5,7,8, 9,10,20, 21,23, 27,28

Brosimum utile **(H)** **Family:-** ***Moraceae***

(Syn: ***Galactodendron utile*****)**

(SANDE)

Description: Sapwood and heartwood not demarcated. Wood is a uniform yellowish-white to yellowish-brown or light brown in colour. Lustre medium. Texture moderately coarse. Grain straight to slightly interlocked. Rays generally prominent on quarter-cut surfaces due to their darker coloured contents. Timber consists mainly of sapwood. Bole is usually well-formed; however, trees having an uneven or badly shaped trunk should not be converted as they are likely to contain tension wood.

Characteristics: Logs are prone to damage by blue stain and should be converted as soon as feasible after felling. Seasons rapidly and easily with little or no degrade. Sands and machines well. Takes stain and finishes readily. Presents no problems in gluing. Stock containing tension wood may cause some machining difficulties and rapid dulling and overheating of saws. Timber takes nails and screws well and has good holding power. Susceptible to insect attack. Peels well. Suitable for mouldings.

References: 1, 2, 5, 48, 84.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24 (80)	0.5 (1½)	9	8	S3	3-4	4	S	8,12,15, 20,30,31

Buchenavia capitata (H) **Family:- *Combretaceae***

(YELLOW SANDERS, GRANADILLO)

Description: Sapwood pale yellow-brown. Heartwood uniform yellow to golden-brown, sometimes with grey or olive hue. Lustre high. Grain straight to more frequently interlocked. Texture medium. A faint odour and mildly astringent taste when wood is green. Growth rings marked by narrow bands of darker pores, producing a ribbon stripe figure on quarter-cut surfaces. Bole is well formed above the large buttresses. Species is found in lower montane evergreen forests, on the lower slopes.

Characteristics: Timber is moderately hard and strong. Air-seasons rapidly with only slight degrade in the form of checking and warping. Shrinks very little, during seasoning. Wood machines with moderate difficulty due to its hardness, but produces good surfaces in all operations. Finishes well and takes a high, satiny polish. Rather difficult to glue. Fairly resistant to termite attack, but presents little resistance to marine borers. Heartwood extremely resistant to impregnation. Good weathering and wearing properties. Steam bending characteristics fair.

References: 1, 45, 66, 76, 77, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24 (80)	0.9 (3)	23	8+	S5	2-3	1-2	S	1,2,3,4, 5,8,12, 15,17,20, 21,25,28

Bucida buceras (H) **Family:-** ***Combretaceae***

(Syn: ***Terminalia buceras*****)**

(UCAR)

Description: **Sapwood is yellowish or pale brown, the heartwood dark greenish-brown. Grain straight to interlocked. Texture moderately fine. Very lustrous. Quarter-sawn stock shows longitudinal stripes. Growth rings indistinct. Species is found in forests along coasts and streams. Planted as a shade and ornamental tree especially in coastal and dry regions.**

Characteristics: **Timber is very hard, heavy, strong and tough. Air-seasons satisfactorily. Green 25mm (1 inch) timber may air-dry to 17% moisture content in approximately 6 months under cover with only a moderate amount of degrade. Stock is rather difficult to saw and machine. Very hard to work with hand tools because of its density and hardness. In planing, a reduction of cutting angle may avoid tearing due to interlocked grain. Clean holes can be cut in boring and mortising. Tends to split in nailing or screwing, pre-boring necessary. Well-sanded material takes an excellent polish with all types of finishes. Resistant to termites, but prone to marine borer attack. Heartwood extremely resistant to impregnation with preservatives. Timber has poor steam bending qualities. Wearing properties excellent. Makes a good grade of charcoal. Bark is used for tanning purposes.**

References: 1, 45, 66, 83, 90, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24 (80)	0.9 (3)	23	10	(S1)	4	2	S	1,3,4,5 7,8,9,10, 17,20,21, 23,28

Bursera simaruba (H)

(Syn: *B. gummifera*)

Family:- *Burseraceae*

(ALMACIGO, GUMBO-LIMBO)

Description: Sapwood is not differentiated from the heartwood. Wood is white, yellowish or light brown. Lustre is low to medium. Texture fine to medium. Grain straight, sometimes irregular. Odour and taste not distinct. Growth rings indistinct. Sapwood and heartwood often discoloured to a bluish-grey or brown by sap staining fungi. Boles are fairly straight, unbuttressed, and about 8 to 15m (26-50 feet) in length. Isolated trees are generally short and often crooked. Species occurs on a variety of sites from xerophytic to mesophytic forests. Prefers lowland forests. Bark contains a reddish aromatic resin that hardens on exposure.

Characteristics: Logs must be converted as quickly as possible after felling and treated with preservatives or kiln-dried immediately after sawing to avoid degrade due to sap stain and insect attack. Timber seasons very well with only slight degrade in the form of checking or warping. Works easily with all types of tools and machines. Saws cleanly, planes to a good finish and drills well but with some tearing at exit side. Very sharp, thin cutting edges and reduced feed rates are necessary to avoid tearing and crushing. Turns readily on the lathe. Takes stains and polishes well. Gluing and nailing properties satisfactory. Logs can be peeled without preliminary heating. Timber is very susceptible to termites and to marine borers. Both sapwood and heartwood are easily treated with preservatives. Useful for fuel and charcoal. Resin is used as crude varnish, insect repellent and glue.

References: 1, 5, 20, 27, 38, 45, 48, 55, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrinkage	Durability	Lyctus Suscep.	
15-27 (50-90)	0.8-0.9 (2½-3)	21 24,27 9	6 5 6	S7 (Below) S7 (Below) S7	2	4	S	2,4,8,10, 12,15,18, 20,22,27, 29,31,32

Byrsonima coriacea (H) **Family:- *Malpighiaceae***

(MARICAO)

Description: Sapwood is grey to reddish-brown, distinct from the heartwood which is reddish-brown with a purplish hue and generally marked with darker stripes. Grain straight to slightly wavy. Texture fine. Lustre medium. Tyloses common. Growth rings indistinct. Bole is slender, straight., cylindrical and clear up to about 6m (20 feet) in length. Species occurs along the borders of swamps and generally forms the under-storey of high forest in both lowland and upland. Often found in secondary forests and on lands degraded by farming. Tree is rather ornamental and suitable for shade. Early growth is rapid.

Characteristics: Timber dries rather slowly and fairly-well up to 25mm (1 inch) thickness. Slight checking may occur and distortion tends to be troublesome. Thicker material is considerably more difficult to dry. Works fairly easily with both hand and machine tools. Generally good surfaces are produced in all operations. Bores and mortises excellently. Holes must be pre-bored before nails or screws are driven in, or material may split badly. Timber requires some filling before finishing. Very susceptible to termites and other insects. Reported to have no appreciable resistance to marine borer. Steam bending properties very variable. Heartwood and sapwood moderately resistant to preservative treatment. Stock has been used for charcoal. Bark is employed in tanning.

References: 1, 8, 45, 79, 83, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18	0.5	23	8+	(S4)	3-5	3	(S)	1,2,3,4, 8,12,17, 20,28
(60)	(1½-1)	9	8+	S3				

Caesalpinia granadillo (H) **Family:- *Caesalpiniaceae***

(PARTRIDGE WOOD)

Description: Sapwood 30 to 60mm (1¼-2 1/3 inches) wide, sharply defined from the heartwood and light brown or yellowish-brown in colour. Heartwood is very dark reddish-brown or purplish-red with lighter coloured lines of soft tissue. Lustrous. Grain straight to interlocked. Texture medium and even. No distinct odour and taste. Soft tissue produces a partridge figure on planed back-sawn surfaces. Bole up to 10m (33 feet) long, well formed. Species is found in dry forests and is often planted for decorative purposes.

Characteristics: Timber is very hard and heavy, and very strong. It requires care in seasoning. Difficult to saw and work even before drying. Stock finishes smoothly but grain may be raised by planing. Takes a good polish. Suitable for turnery and carving. Wood dust may cause dermatitis.

References: 3, 14, 20, 35.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23 (75)	0.9 (3)	9	10+	(S1)	(5)	1	S	8,9,10,11 17,20,27, 28

Calophyllum brasiliense (H) **Family:-** ***Clusiaceae (Formerly Guttiferae)***

(SANTA MARIA, ACEITE MARIA)

Description: Sapwood is 40 to 65mm (1½-2½ inches) wide, pale pink in colour and distinct but not always clearly differentiated. Heartwood is pink or yellowish-pink to red or rich reddish-brown, marked with fine darker coloured strips formed by thin bands of parenchyma. Texture is medium and fairly uniform. Grain may be straight, or frequently interlocked. Lustre medium. Quarter-sawn surface shows an attractive ribbon figure. Growth rings not evident. Bole is unbuttressed, straight, well formed and clean, up to 15 to 21m (50-70 feet) in length. Species prefers wet, humid sites but grows very well on pure sand and on rocky sand-stone soils in dry areas. Crushed or cut bark produces a yellow gummy-resin.

Characteristics: Moderately difficult to air-season. Timber dries slowly with considerable warping and splitting and a tendency for knots to split. Quarter-sawn material is reported to kiln-dry satisfactorily when low-temperature and high-humidity kiln schedules are used. Fairly easy to work: resistance to cutting is medium, blunting effect is moderate. Brown gum streaks, when present, cause rapid blunting of cutting edges. In planing, a reduction of cutting angle to 15-20° is necessary to prevent tearing. In drilling and mortising, a little care is needed to prevent tearing at the exit of the tool. Has good resistance to splitting. Glues well. Stains and finishes satisfactorily, if filler used. Very susceptible to attack by marine borers but moderately resistant to termites. Sapwood permeable to impregnation, heartwood extremely resistant. Reported to peel or slice with difficulty. Moderately good for steam bending. Reasonably stable in use. Dust causes dermatitis.

References: 8, 14, 15, 16, 23, 38, 43, 45, 47, 53, 61, 64.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-45 (100-150)	1-1.5 (3¼-5)	1 30	8 7+	S5 S4	4-5	2	N	1,2,3,4,5,6,7,8,12,17,20,21,23,25,28

Calycophyllum candidissimum (H) Family:- *Rubiaceae*

(DEGAME, LEMONWOOD)

Description: Sapwood wide, not sharply demarcated from the heartwood, and white to brownish-white in colour. Heartwood is light brown to grey, more or less variegated. Lustre medium. No noticeable smell or taste. Grain variable from straight to very irregular, with a narrow and indistinct stripe on quarter-cut surfaces. Texture fine and uniform. Bole is slender and 10 to 15m (33-50 feet) in length. Species may form almost pure stands in some places. Commonly found along waterways.

Characteristics: Timber develops some slight surface and end-checking during the air-seasoning process, with tendency to warp when dried in small sizes. Stock is moderately difficult to machine and has a moderate blunting effect on cutting edges. Its resistance to cutting is medium, with some tendency to split in mortising or drilling. Finishes smoothly and takes a good polish. Carves and turns well. Moderately resistant to termite attack. Wood is hard, strong, resilient and bends well without breaking. Used in archery as a substitute for LANCEWOOD (Oxandra lanceolata). Stable when seasoned. Reputed to be highly resistant to marine borer attack.

References: 1, 2, 5, 8, 10, 17, 27, 35, 42, 43, 47, 61, 81, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
12-20 (40-65)	0.5 (1½)	9 8	8+ 8+	S3 S2	4-5	2-3	(S)	2,7,8,9,10,11,16,17,20,24,28

Carapa guianensis (H) **Family:** *Meliaceae*

(CRABWOOD, ANDIROBA)

Description: Sapwood 25 to 50mm (1-2 inches) thick, pinkish when freshly cut, turning pale brown or greyish when dry, often with brown or black flecks, not sharply demarcated. Heartwood is pale pink to reddish-brown when freshly cut, becoming reddish-brown to dark brown when seasoned. Lustre medium. Grain straight, sometimes interlocked. Texture coarse to fine, mostly medium. Growth rings not always visible. Ripple marks occur sporadically in the denser tissue. Bark contains tannin and an alkaloid called carapina. Trunks are usually swollen at butt or buttressed up to 1m (3¼ feet) from ground. Boles 9 to 27m (30-90 feet) in length, cylindrical or slightly flattened and moderately straight. Species is found in equatorial evergreen hardwood forests. Very common in inundated areas, river and lowland forests occasionally in nearly pure stands. A fast-growing species.

Characteristics: Timber air- and kiln-seasons rather slowly with a tendency to warp and check. For air-seasoning, slow drying under cover is advisable. Low temperature and high humidity during early stages of kiln-drying are recommended. Works easily with machine and hand tools and has moderate blunting effect on cutting edges. A 15° knife angle for planing is necessary in presence of interlocked grain. Saws well and finishes smoothly, though wavy material requires plenty of sanding. Holds nails well but tends to split; takes screws well. Glues well. Stains readily and takes a high polish, but requires a filler. Not suitable for steam bending. Weathering properties good. Peels well. Prone to termite attack, but moderately resistant to marine borers. Logs are liable to pinhole borer attack. Heartwood extremely resistant to impregnation. Rates as very good in fire resistance. Moisture movement moderate to low. Fairly stable in use. The extract carapina is used medicinally and the bark occasionally in tanning. Oil from seeds used industrially in the manufacture of soap, candles, etc.

References: 1, 3, 8, 13, 15, 20, 23, 27, 34, 38, 40, 44, 47, 52, 60, 61, 86, 96.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-40	0.9-1.2	9	7+	S3	4-5	3	S	2,4,6,7,
		12	7+	S4				8,10,12,
(100-130)	(3-4)	1,11	8	S4				13,14,15, 17,20,22, 31

Cariniana legalis (H) Family:- *Lecythidaceae*

(JEQUITIBA)

Description: Sapwood is greyish to pale brown, usually not well defined from the heartwood which is yellowish, pinkish or reddish-brown in colour, sometimes with darker streaks. Lustre medium to high. Grain straight. Texture fine to medium, even. Odour and taste not distinct. Timber may contain very small amounts of silica. Bole is free of branches for 18 to 25m (60-82 feet) in length. Species occurs in mixed hardwood forests.

Characteristics: Little degrade occurs during drying. Timber works easily with hand and machine tools but has slight blunting effect on cutting edges. In planing, it generally finishes well if sharp cutters are employed. Tends to split when nailed - pre-boring may be required. Glues satisfactorily. Damage by pinhole borer is sometimes present. Heartwood is reported to be extremely resistant to preservative treatment, but sapwood is permeable. Stable when manufactured. Peels satisfactorily. Dust may cause dermatitis and breathing problems.

References: 1, 5, 8, 10, 14, 35, 43, 47, 53, 61, 83, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-38 (100-125)	0.9-1.2 (3-4)	1	7	S4	2-3	2	(S)	2,4,6,8, 12,17,20

Cariniana pyriformis (H) **Family - *Lecythidaceae***

(ALBARCO, BACU)

Description: Sapwood pale in colour and usually not clearly demarcated from the reddish or brownish heartwood. Lustre medium to high. Texture rather fine. Grain straight to slightly interlocked, and sometimes attractively figured. Bole is straight and cylindrical with clear length of 15 to 24m (50-80 feet). Buttresses strongly developed. Species is common on lower slopes and well-watered valleys, and does not extend into flood plains except occasionally in better drained areas. Occurs at altitudes of up to 600m (2000 feet).

Characteristics: Timber is moderately hard and heavy, tough and strong. With careful seasoning, material does not warp, check or shrink excessively. Fairly difficult to saw because of its silica content. Reported to dull saws and other tools very quickly. Cutters tipped with tungsten carbide and the use of slower feed-speeds are recommended. Timber works easily, but a filler is required to obtain a lustrous finish. Takes paints satisfactorily. Nailing, screwing and gluing properties good. Resistant to termites and marine borers, and to impregnation with preservatives. Stock is resilient and quite resistant to shock. Good dimensional stability. Peels and slices well. Bark is used for rough cordage.

References: 1, 20, 66, 83, 87, 89, 90, 97.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
38-53 (125-175)	0.9-1.5 (3-5)	8	8+	(S3)	4-5	2-3	N	1,2,3,4, 6,7,8,9, 12,17 20,23

Caryocar villosum **(H)** **Family:- *Caryocaraceae***

(Syn: *C. brasiliense*)

(PIQUIA)

Description: Sapwood narrow, not well demarcated from the yellowish to pale greyish-brown heartwood. Lustre low. Grain interlocked, resulting in a stripe figure on radial surface. Texture medium, uniform. Growth rings distinct. Vinegary odour when green, not distinct when dry. A very large tree with a bole that is usually high and straight. Species is found in upland forest on sandy soils.

Characteristics: Timber is hard, heavy, very strong and tough. Air-seasons slowly with a tendency to check, warp and caseharden. Stock is reported as fairly easy to saw but requiring sharp tools to finish smoothly. Does not take nails and screws well. Polishes satisfactorily. Resistant to termite and moderately resistant to marine borer attack. Excellent wearing properties but only fair in its resistance to weathering.

References: 1, 15, 20, 66, 76, 77, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36-45 (120-150)	1.5-2 (5-7)	1	9+	S3	4	1	(N)	1,2,3,4, 5,6,7,8, 20,21,23, 28

Catostemma fragrans (H) **Family:- *Bombacaceae***

(BARAMALLI)

Description: Sapwood is not well defined. Paler in colour than the heartwood, which is oatmeal to yellowish or pale brown, with occasional streaks and a yellowish tinge. Not lustrous. Grain straight. Texture rather coarse but uniform. Growth rings not clearly visible. Bole is cylindrical and clear of branches up to 27m (90 feet) in length. Unbuttressed. Species is found in dry evergreen- and rain-forests.

Characteristics: Timber may present some trouble in conversion and must be seasoned with care. Stock does not work easily, quickly blunting cutting edges. Due to its gritty nature, very frequent sharpening of tools is necessary. However, with care it can be planed to a smooth surface. Does not polish well but glues and paints satisfactorily. Suitable for cheap furniture.

References: 13, 27, 31, 35, 49, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.6 (2)	11	6+	S5	5	4	S	2,4,8,9, 11,13,17, 20,28

Cecropia peltata **(H)** **Family:-** ***Moraceae***

(YAGRUMO HEMBRA)

Description: Timber is apparently almost all sapwood and whitish when freshly cut, turning pale brown to oatmeal on exposure. Fairly lustrous. Grain generally straight, texture coarse. Species is found in open areas and in forests. On some lowland flats, it constitutes the most characteristic elements of vegetation, often forming pure stands on old clearings. Trees propagate naturally and develop very rapidly in the initial stages.

Characteristics: Timber is usually light, soft, weak and brittle. It air-seasons rapidly but with considerable amount of degrade. Boards are liable to blue stain, and should be treated with a fungicide or allowed to dry rapidly after sawing. Stock saws and machines easily when dry. Due to the porous nature of the timber, surfaces tend to tear and fuzz in shaping and turning, and to crush or crumble in boring and mortising. However, it takes nails and screws readily, and holds them firmly. Planes and sands well but does not take varnish readily. Species is very susceptible to termites, pinhole borers and other insects. Density and strength properties vary markedly with area of growth. The lightest grade of this timber should be a good substitute for the moderately heavy grades of balsa wood. It is reported that the timber ignites easily by friction.

References: 1, 45, 87, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
21 (70)	0.6 (2)	23 9	4 7	S7 (Below) S5	1-3	4	S	12,13,15, 17,18,19, 20,22, 27,32

Cedrela fissilis (H) Family:- *Meliaceae*

(SOUTH AMERICAN CEDAR, CEDRO)

Description: Sapwood is whitish or yellowish-pink, clearly demarcated from the heartwood which varies from pale pinkish-grey to deep reddish-brown with pronounced stripes and a high golden lustre. Texture moderately coarse. Grain straight or slightly interlocked. Growth rings well demarcated. Characteristic fragrant scent usually present, taste slightly bitter. Soft tissue fairly abundant and found around the pores as well as in lines more or less parallel to the rings. Some cells are filled with resin. Prominent buttresses often present. Bole is straight, cylindrical and the clear lengths above the buttresses may extend 12 to 18m (40-60 feet). Species is found in lowlands along streams and upland rain forests. Prefers well-drained slopes on chalky soils. Species grows fast to moderately rapidly. Natural regeneration may be encouraged by clearing around seed trees. Often planted along streets and sometimes for shade.

Characteristics: Timber seasons fairly rapidly with little or no splitting or warping if handled with care. Some tendency to collapse in drying may occur. Works easily with both hand and machine tools. Finish may be affected by interlocked grain and occasional gum pockets. In planing, 200 cutting angle will give a good finish. Timber has good gluing, nail holding and screw holding characteristics. Stains and polishes well, Slices readily. Reported to have moderately good steam bending properties. Moisture movement small. Excellent weathering characteristics. Very susceptible to termites. Damage by pinhole borer sometimes present. Heartwood extremely resistant to preservatives but sapwood permeable. Moderately good fuel.

References: 1, 4, 6, 8, 14, 16, 20, 64, 66, 67, 68, 69, 95.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
21-30 (70-100)	1.3 (4¼)	1 2	7 7	S5 S6	3-4	2-3	S	2,6,7,8, 12,13,14, 15,17,20, 22,25,27, 30,31,32

Cedrela mexicana **(H)** **Family:** ***Meliaceae***

(Syn: ***C. odorata*****)**

(CENTRAL AMERICAN CEDAR, CIGARBOX CEDAR)

Description: Sapwood pinkish-white, clearly demarcated from the heartwood which is red to reddish-brown. Lustre medium to high. Grain normally straight with little or no figure. Texture variable from fine and uniform to coarse and uneven. Growth rings distinct. Characteristic fragrant scent but no appreciable taste. Timber sometimes exudes gum. Boles are 12 to 18m (40-60 feet) long, straight, cylindrical and buttressed, usually with eccentric hearts. Species is found in mixed rain forests on a variety of soils. Prefers deep, well drained soils with plenty of light. It grows typically on hillsides and does not tolerate swamps. Natural regeneration profuse in places. Often planted as an ornamental and shade tree.

Characteristics: Timber air-seasons well with a tendency to end-checking during early stages. Kiln-drying is rapid and satisfactory with little degrade. Stock works easily with hand and machine tools, and has little dulling effect on cutting edges. Planes to a good finish with a cutting angle of 300, provided knives are sharp. Nailing and screwing properties good. Can be glued very well. Stains readily. Takes varnish and polish with excellent results if filler is applied. Steam bending properties good. Peels well. Difficult to cut clean holes in mortising and boring unless the exit side is well supported. Heartwood occasionally subject to damage by pinhole borers. Resistant to termite but prone to marine borer attack. Heartwood extremely resistant to impregnation but sapwood permeable. Good weathering properties.

References: 1, 2, 5, 10, 11, 18, 19, 20, 21, 23, 34, 35, 36, 38, 40, 53, 55, 95, 100, 122.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.6-1.2 (2-4)	9 17 21 18 (Exotic) 19 (Exotic)	6+ 7 6+ 5+ 6	S6 S6 S5 S7 S7	2-3	2	S	2,6,7,8, 12,14,15, 16,17,18, 20,22,24, 27,28,32

Ceiba pentandra **(H)** **Family:** ***Bombacaceae***

(Syn: ***Bombax pentandrum*****)**

(CEIBA, FUMA)

Description: Sapwood is difficult to distinguish from the heartwood, which is tan when freshly cut with russet or yellow-tan streaks, turning to a very light greyish-brown, sometimes with pinkish tinge, when dry. Often discoloured to blue-grey by staining fungi. Texture coarse. Grain straight. Drab appearance and low lustre. No distinct odour and taste present. Bole is straight and cylindrical. Buttresses are often high, of plank form and wide-spreading. Species is common on slopes and hillsides as well as flats and swamps, preferring rich fertile soils along streams and alluvial basins. Seeds produce kapok. A fast-growing species. Easily propagated from cuttings and commonly planted as an ornamental and crop tree. It is also found in tropical Africa.

Characteristics: Logs must be extracted, converted and dried as soon as possible after felling to prevent discoloration by blue stain, fungi and insect attack. Timber seasons rapidly, free of any appreciable checking and warping. Works readily and machines easily but not satisfactorily. In both ripping and crosscutting, it tends to develop fuzziness. Cutters must be kept very sharp for good results. Excellent surfaces obtained with planing and sanding. Difficult to shape, bore, turn and mortise because of its tendency to tear. Nails and screws easily, but has poor holding characteristics. Peels and glues satisfactorily if logs are fresh. Very susceptible to attack by termites and other insects. Permeable to preservative treatment. Good-acoustic properties. Suitable for paper pulp.

References: 1, 5, 10, 18, 20, 35, 36, 45, 66, 75, 103, 131.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
45 (150)	2 (7)	9,22 31,32	3	S7 (Below)	2	4	S	8,10,11, 12,13,14, 15,18,20, 22,24,27, 29
		8,20	4	S7 (Below)				
		33	5	S7 (Below)				

Chlorophora tinctoria (H) Family:- *Moraceae*

(MORA AMARILLA, MORAL)

Description: Sapwood is cream-white and sharply demarcated from the heartwood which is bright yellow, becoming russet or pale brown, sometimes with a reddish tinge. Lustre high and satiny. Grain is typically interlocked producing a fine ribbon figure on radial surfaces. Texture moderately fine and even. Latex tubes occasionally present in rays. Forest grown specimens may show straight and clear boles, from 6 to 15m (20-50 feet) in length. Open grown trees often have short and crooked boles. Species is widely distributed throughout Tropical America. Natural regeneration fairly good.

Characteristics: Timber is hard, heavy, tough and strong. Air-seasons readily and well, at a fast to moderate rate, with only slight checking and warping. Grain may be raised during planing, due to interlock. Stock is moderately difficult to work with hand and machine tools but finishes smoothly, taking a high polish. Reported to dull tools fairly quickly. Glues well. Very resistant to termites but prone to marine borer attack. Heartwood extremely resistant to preservative treatment but sapwood treatable to some extent. Weathering properties very good. Steam bending properties moderate. Timber ignites easily. Produces a yellow dye. Sawdust may cause irritation to skin, nose and throat. Chemically active to iron.

References: 1, 6, 20, 47, 55, 66, 76, 78, 83, 87, 95.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18-24 (60-80)	0.6 (2)	21 9 15 1 2 4	9+ 9 8+ 9 9 9	S2 S2 S3 S2 S2 S1	3	1	S	1,2,3,4, 5,6,7,8, 9,14,17, 20,21,23, 24,28

Clarisia racemosa (H) **Family:- *Moraceae***
(Syn: *Soaresia nitida*)

(OITICICA, GUARIUBA)

Description: Sapwood about 75mm (3 in) wide, whitish in colour, with yellow vessel lines. Heartwood is uniform bright yellow becoming orange-brown or russet with age. Lustre high and golden. Grain usually interlocked producing a ribbon figure on radial surfaces. Texture medium. Growth rings distinct. Bole clear length 15 to 18m (50-60 feet), well formed and unbuttressed. Species is common in rain forests, mostly on lands not subject to floods. Often found scattered amongst other hardwoods or in small groups.

Characteristics: Timber is easy to season, developing only very slight degrade when dried slowly. Well seasoned stock has acceptable dimensional stability. Saws easily but surfaces tend to be woolly in green timber. Stock works well but dulls tools rather quickly. Sharp cutting edges must be used to produce smooth surfaces. Does not take nails and screws well. Glues and stains satisfactorily. Prone to termite, marine borer and pinhole borer attack.

References: 1, 20, 33, 41, 47, 82, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	0.9 (3)	8,9 7	8 7+	S3 (S4)	4-5	(3-4)	(S)	1,2,3,4, 8,12,17, 20

Clusia rosea **(H)** **Family:** ***Guttiferae***

(COPEY)

Description: Sapwood is pale reddish-brown merging gradually into the darker reddish-brown heartwood. Moderately lustrous. Grain straight, texture medium to fine. No odour or taste. Growth rings indistinct. Species is common in forests on river banks and hillsides. Tree is suitable for ornamental plantings.

Characteristics: Timber is hard, heavy and strong. It air-seasons at a medium rate with moderate degrade. Stock is rather difficult to saw and machine due to its density and hardness but produces fair to good surfaces in all operations. However, in planing and boring, tearing and crushing may occur frequently. Screwing characteristics good. Glues and polishes well. Timber is very susceptible to pinhole borers, termites and probably to marine borer attack. Used principally for fuel, fence posts and rural constructions. The resin from the fruit is sometimes used medicinally.

References: 1, 45, 87, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18 (60)	0.6 (2)	23	9	(S3)	4-5	(3)	(S)	1,2,8,9, 11,20,23

Cordia alliodora (H)

Family:- *Boraginaceae*

(Syn: *C. gerascanthus*)

(LAUREL BLANCO)

Description: Sapwood 25 to 75mm (1-3 inches) wide, not sharply demarcated, and yellowish to light brown in colour, freshly cut heartwood is light greenish-brown to olive-brown frequently with black streaks, turning to pale golden-brown to brown. Grain generally straight, sometimes interlocked. Texture fine to moderate. Lustre medium to high. Growth rings delineated by narrow dark lines of pores. Small dark rays give the wood a mottled appearance on quarter-sawn surfaces. In general, no odour or taste present but a few darker coloured specimens may have a distinct spicy odour. Bole may be 4 to 6m (13-20 feet) long. Narrow, 1.8m (6 feet) high buttresses present. Species is found in hilly rain forest, in secondary formations and on river flood plains.

Characteristics: Wood is moderately strong and hard, but strength properties vary with area of origin. Timber air-seasons rapidly with only slight checking and warping. Saws and machines easily, finishes smoothly and glues readily. Tends to split when screwed and nailed - pre-boring is necessary. Takes a good polish and is stable when manufactured. Resistant to termites, but very susceptible to attack by marine borers. Heartwood moderately resistant to preservative treatment. Weathering characteristics excellent. Only fair in steam bending properties.

References: 1, 13, 27, 31, 45, 47, 55, 76, 77, 79, 95.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
12-18	0.5-0.6	9	7	S5	3-4	(2)	S	2,6,8,12,
		26	7+	S4				14,17,20,
			6+	S7				28,32
(40-60)	(1½-2)	15						
		17	6	S7				
		8	7	S6				

Cordia goeldiana (H) **Family:- *Boraginaceae***

(FREIJ0)

Description: Sapwood not always clearly differentiated from the heartwood which is light grey-yellow or light grey-brown, sometimes marked with darker streaks. Lustrous. Grain usually straight or shallowly interlocked. Texture moderately fine, uniform. Odour peculiar but not pronounced, taste indistinct. Growth rings distinct. Boles 12 to 18m (40-60 feet) in length. Species prefers moist soils. Occurs in tropical forests.

Characteristics: Timber seasons well with little distortion but with tendency to end-splitting. Stock works easily with all hand and machine tools, with very little dulling effect on cutting edges. Planes and moulds to a clean finish if cutting edges are kept sharp. In mortising, boring, and end-grain working, timber requires adequate support to prevent chipping. Not suitable for turnery. Tends to split in nailing. Takes stain very well and polishes satisfactorily when filled. Steam bending properties moderately good. Reported to be attacked by termites. A good jointing timber which glues well. Very stable when dry.

References: 1, 3, 8, 14, 20, 23, 27, 43.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-0.9 (2-3)	1	7+	S4	3-4	2-3	S	6,7,8, 12, 17,20

Cordia trichotoma (H) **Family:- *Boraginaceae***

(PETEREBY)

Description: Sapwood is yellowish-grey, well demarcated from the heartwood which is grey to greyish-brown, sometimes golden-brown with a marked figure. Lustre is medium to high. Grain generally straight or interlocked. Texture medium and uniform. Timber has a pleasant odour but indistinct taste. Appearance oily or waxy. Growth rings usually indistinct. Bole is symmetrical, slender and unbuttressed. Tree may have clear bole lengths of 12 to 15m (40-50 feet). Species is found in mixed hardwood forests, where it occupies the sandy or clay loam in the vicinity of the rivers.

Characteristics: Timber is fairly strong, rather soft and of medium density. It does not check or warp to any great extent in seasoning and holds its shape well when manufactured. Stock works easily with hand and machine tools, finishes smoothly and takes a very high polish. Glues well. Susceptible to attack by termites. Peels and slices well.
A satisfactory substitute for EUROPEAN OAK (*Quercus robur*) for the manufacture of high class furniture.

References: 1, 5, 6, 9, 16, 20, 28, 65, 66.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-38 (100-125)	0.5-0.6 (1½-2)	2 1	7+ 8	S4 S3	4	3	S	6,7,8, 12,17,20

Couratari pulchra (H) Family:- *Lecythidaceae*

(TAUARY, WADARA)

Description: Sapwood not distinct from the heartwood which is cream coloured with a pinkish or yellowish tinge. Lustre moderate to low. Texture medium. Grain straight to interlocked. Vascular lines clearly visible. Timber contains silica. Bole is well formed and may be 24 to 30m (80-100 feet) in length. Tree is heavily buttressed up to 5.5m (18 feet). Species is found in rain- and marshy-forests.

Characteristics: Timber air-seasons at a fair rate with moderate checking and slight warping. Variable in machining properties but generally machines readily,producing smooth surfaces. May present some dulling effect on cutting edges. Easy to polish but requires filling. Takes nails and screws moderately well with a slight tendency to split. Glues well. Resistant to marine borer. Sapwood permeable to impregnation with preservatives. Weathering characteristics fair. Steam bending properties poor. Good dimensional stability. Suitable for marine piling.

References: 33, 49, 50, 76, 78, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data.	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
45 (150)	0.6 (2)	1 8,9 11	8 7+ 7	S4 S4 S5	4	2	(S)	1,2,3,4, 8,12,15, 17,23

Cupressus lusitanica (S) **Family:-** ***Cupressaceae***
(Syn: *C. glauca*)

(MEXICAN CYPRESS) (EXOTIC)

Description: Sapwood 25 to 75mm (1-3 inches) wide. Heartwood is yellowish-brown to pinkish-brown and usually quite indistinct from the paler sapwood. Timber fades on exposure. Grain usually straight. Texture fine and fairly even. Growth rings distinct but not conspicuous. Resin cells present and may appear as occasional brown streaks. Freshly cut wood has a faint cedar-like odour. Young plantation stock contains a fair amount of low grade knotty material. Good growth rates have been reported from Brazil at altitudes between 700 and 1800m (2300-6000 feet) in the summer rainfall area, mainly on shallow soils. Boles are generally well formed and straight. Species is a native of Mexico and parts of Central America. Prefers highland areas with a summer rainfall and moist, good soils. Has been also planted in Argentina and Chile with apparently good results.

Characteristics: Timber air-seasons and kiln-dries rapidly with slight degrade, except with high temperature schedules which may cause distortion. Saws well with all standard saws including bandsaws. Stock works easily and finishes well, but in boring support is necessary at the tool exit for obtaining clean holes. Nailing and screw holding properties good. Sapwood and heartwood moderately resistant to preservative treatment but incising improves retention. Suitable for moulding and peeling. Used as fuel in some countries.

References: 1, 18, 19, 36, 87, 91, 106, 124, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5 (1½)	1,19, 20	6+	S6	2-3	3-4	N	2,4,6,7, 8,11,12, 13,15,17, 18,20,21, 22,23,27, 28,30

Cyrilla racemiflora (H) Family:- *Cyrillaceae*

(SWAMP CYRILLA)

Description: Sapwood pale brown, not clearly demarcated from the light to dark reddish-brown heartwood. Deeply coloured specimens can be somewhat oily. Lustre moderate to low. Grain highly interlocked, texture fine and uniform. Growth rings distinct. No odour or taste. Logs are short and generally hollow. Species is fairly common along streams and at the edge of swamps. Occurs also in upper mountain rain forests.

Characteristics: Timber air-seasons slowly with exceptionally severe degrade and very high shrinkage. Stock is relatively easy to saw and machine. Machining properties are generally good to excellent, giving glossy smooth surfaces. Resistance to screw splitting good. Very susceptible to termite attack and presumably that of other insects. Due to the timber's extremely poor seasoning characteristics, its most satisfactory use is in the green condition and where drying will not take place. Suitable for buried piling and underwater parts of docks and wharves. Used for charcoal production.

References: 1, 45, 87, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-18 (50-60)	0.9-1.8 (3-6)	23	8+	(S4)	5	(3)	(S)	1,2,23

Dalbergia nigra (H) **Family:- *Papilionaceae***

(BRAZILIAN ROSEWOOD, JACARANDA)

Description: Sapwood pale yellow or nearly white, sharply but irregularly demarcated from the heartwood which varies in colour from chocolate or violet-brown to rich purplish-black with irregular black streaks. Texture medium. Grain generally straight, sometimes wavy. Appearance often oily and irregularly lustrous. When fresh, the wood has a mild scent and slightly sweet taste. Bole irregular, often buttressed, and up to 14m (46 feet) in length. Old trunks are often hollow. Species is found in hardwood forests and coastal formations.

Characteristics: Timber is hard, heavy and strong. Seasons well but should be dried slowly to prevent splitting and checking. Machines well but fairly difficult to work with hand tools. Finish can be improved if the cutting angle is reduced to about 20°. Has a fairly severe blunting effect on cutting edges. Turns excellently and polishes fairly well. Straight grained, clear timber has very good steam bending properties. Weathering and wearing characteristics excellent. Generally resistant to insect attack although logs are frequently attacked by pinhole borers. Gluing properties variable. Stable. Slices very well. Used for high grade furniture and cabinet work. Dust may cause dermatitis.

References: 1, 3, 5, 7, 8, 9, 20, 32, 47, 53, 61, 96, 119.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
38 (125)	0.9-1.2 (3-4)	1	9+	S3	3-4	(1)	S	1,3,5,6, 7,8,9,10, 12,14,17, 20,21,23, 27,28

Dalbergia retusa (H) Family:- *Papilionaceae*

(COCOBOLO)

Description: Sapwood is pale cream to white and clearly defined. Heartwood is variegated in colour when freshly cut usually turning a deep red or reddish-brown with black striping or mottling on exposure. Wood has waxy appearance. Lustre low. Odour pungent, taste indistinct. Texture medium to fine and uniform. Grain straight to interlocked. Bole is usually of poor form.

Characteristics: Timber is very hard, heavy and strong. Requires care in seasoning as it is liable to caseharden, warp and check when kiln-dried from the green condition. A period of air-seasoning prior to kiln-drying is recommended. Stock works reasonably well in all hand or machine operations and has moderate blunting effect on cutting edges. Turns readily and finishes very smoothly. Unsuitable for gluing. The presence of a natural oily substance is said to contribute to its stability in use and to give the wood a high natural polish. Used for high quality turnery and inlay work. Dust from machining operations may cause dermatitis.

References: 1, 10, 20, 27, 47, 55, 61, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18 (60)	0.6 (2)	30	10	(S1)	2	1	(S)	9,14,15, 16,17,28

Dialium guianense (H) **Family:-** ***Caesalpiniaceae***

(Syn: ***D. divaricatum*****)**

(JUTAHY)

Description: Sapwood is whitish or yellowish, merging gradually into the pinkish-brown to uniform brown or reddish-brown heartwood. Lustre medium. Texture moderately fine. Grain is closely interlocked, producing a ribbon figure on radial surfaces. Bole is straight, cylindrical and up to 18m (60 feet) long above the narrow buttresses which sometimes reach 1.8m (6 feet) high. Species grows in dense evergreen forests on well-drained clay soils, at the edge of virgin forests or in secondary formations on sandy soils.

Characteristics: Timber is very hard, heavy, tough and strong. Moderately difficult to saw and work with machine and hand tools. Saw-teeth and cutter edges may be affected by high silica content. Pre-boring necessary for nails and screws. Finishes smoothly. Wood is resistant to termites and probably to marine borers due to its silica content. Bark is used for medicinal purposes. Dust may cause skin irritation and coughing.

References: 1, 20, 49, 55, 83, 87, 130.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.9 (3)	1,8	10	S1	5	(1-2)	(S)	1,2,3,4, 5,6,7,9, 11,21,23

Dialyanthera gordonifolia & D. otoba (H) **Family:- *Myristicaceae***

(CUANGARE, OTOBO) (COMBINED GROUP)

Description: Sapwood may be over 100mm (4 inches) wide and is generally not demarcated from the heartwood. Wood is uniform yellowish-brown often with a pinkish tinge. Lustre high. Grain is generally straight and texture medium. Growth rings indistinct. Gum ducts frequently present. Boles are straight. Species occurs in upland forests.

Characteristics: Timber is light and soft. It air-seasons and kiln-dries readily, but material containing dark coloured zones may collapse during the kiln-drying process. Timber is easy to work and finishes smoothly. Takes nails well and glues satisfactorily. Reported to be very susceptible to termite attack. Logs are liable to blue stain and pinhole borer attack. Sapwood and heartwood permeable to impregnation. Normal timber is used for core stock. A softwood substitute.

References: 1, 5, 8, 41, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18-27 (60-90)	0.6 (2)	8,7	5+	S7 (Below)	5	4	S	8,12,13, 15,17,18, 20,22

Dicorynia guianensis (H) **Family:- *Papilionaceae***

(Syn: *D. paraensis*)

(ANGELIQUE)

Description: Sapwood is narrow, greyish or brownish-white, and sharply demarcated from the heartwood which is russet when first cut, darkening to brown, grey-brown or purple-brown on exposure, occasionally with darker streaks. Lustre moderate to high. Texture medium, uniform. Grain usually straight, sometimes slightly interlocked. Growth rings indistinct. No odour and taste. Vessels prominent on side-grain surfaces. Timber contains from 0.2 to almost 3.0% of silica. Boles are straight, cylindrical and buttressed, and 15 to 20m (50-65 feet) long. Species occurs in rain forests and in the transition zone between rain and savanna forests. Prefers well-drained soils.

Characteristics: Timber is hard, heavy, tough and strong. Seasons rapidly and moderately well, but with end and surface checking, warping and casehardening in thick stock. There are no difficulties when dried at a moderate rate. Working properties vary with density and silica content, but are generally satisfactory. Cutting edges dull quickly if material is rich in silica. Stellite-tipped blades are recommended in sawing. Finishes smoothly and glues moderately well. Takes nails and screws with some difficulty. Heartwood durable to very durable to white-rot and brown-rot fungi. Resistant to marine borers and moderately resistant to termites. Heartwood extremely resistant to preservative treatment. Timber is acid-resistant and stable in use. Considered a fairly good substitute for TEAK (*Tectona grandis*) for certain uses. Weathering properties fair.

References: 1, 2, 3, 8, 20, 29, 38, 44, 46, 47, 52, 53, 87, 147.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
45 (150)	1.5 (5)	12,11 13	8+ 9	S3 S2	5	1	S	1,3,4,5, 6,7,8,9, 11,12,17, 20,21,23, 25,28

Didymopanax morototoni (H) **Family:- *Araliaceae***

(MOROTOTO, YAGRUMO)

Description: Sapwood and heartwood not demarcated. Wood is pale brownish in colour. Lustrous. Texture medium to rather fine. Grain generally straight. Odour and taste not distinct. Growth rings not distinct. Gum ducts present. Boles 15 to 20m (50-65 feet) in length, cylindrical and basally swollen. Species occurs in rain forests, edges of savannas, and old clearings. Occasionally found in marsh forests. A fast-growing species.

Characteristics: Logs must be removed from the forest and converted soon after felling to prevent damage by pinhole borers. Timber seasons rapidly but with considerable degrade in the form of moderate to severe warping. Works easily with either hand or power tools. Planes well except for occasional fuzziness in some pieces. Difficult to trim, bore and mortise due to some excessive tearing and crushing. Very sharp and thin cutting edges and reduced feed rates are necessary to obtain good machined surfaces. Takes nails and screws very well without splitting. Somewhat difficult to polish. Timber is very susceptible to termites, marine borers and other insects. Resistance to preservative treatment variable. Peels well.

References: 1, 20, 27, 44, 45, 49, 50, 87, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5-0.6 (1½-2)	9,12	7	S4	5	4	S	2,4,8,12, 13,15,17, 18,19,20, 22,27,29, 30,31

Diplotropis purpurea (H) **Family:-** ***Papilionaceae***
(Syn: ***D. guianensis*****)**

(TATABU, SUCUPIRA)

Description: Sapwood is narrow, greyish-brown or pinkish-grey and clearly demarcated. Heartwood is dark brown or greyish-brown with fine lighter coloured stripes. Lustre medium to high. Grain usually straight to slightly interlocked or sometimes irregular. Texture coarse, appears waxy. Growth rings usually indistinct, occasionally poorly visible. No odour and taste. Bole usually straight, cylindrical and up to 18 to 21m (60-70 feet) in length. Trunk unbuttressed or with few thin buttresses. Species occurs in upland rain forests.

Characteristics: Timber is very hard, heavy, tough and strong. Dries reasonably rapidly, but is generally considered moderately difficult to season. Must be air-dried slowly to avoid degrade. Considerable losses may also occur in kiln-drying unless a slow drying schedule is used. Timber is moderately difficult to work. Saws well but is somewhat difficult to plane if interlocked grain is present, then requiring considerable sanding for a smooth finish. Turns, well and polishes satisfactorily after filling. Takes screws well but nails with difficulty. Has a high screw holding power. Resistant to termites but liable to marine borer attack.

References: 20, 38, 44, 49, 50, 51, 75, 87, 90, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-30 (90-100)	0.6-0.8 (2-2½)	12 1,9	9 9	S2 S1	4	1-2	S	1,2,3,4, 5,6,7,8, 9,11,20, 21,23,28

Dipteryx odorata (H) **Family:-** ***Papilionaceae***
(Syn: *Coumarouna odorata*)

(T0NKA)

Description: Sapwood is 25 to 50mm (1-2 inches) wide and yellowish or yellowish-brown in colour. Heartwood reddish-brown or purplish-brown when freshly cut with attractive paler streaks, turning to a uniform light brown on exposure. Texture is fine, lustre medium and grain irregular, often interlocked. Wood is characterized by prominent vessel lines and by narrow stripes on radial surfaces. There is no distinct taste but a faint vanilla-like or rancid odour. Appearance waxy. Bole is clear, cylindrical and unbuttressed, up to 24m (80 feet) in length. Species is found in rain and savanna forests. Prefers well-drained gravel or sandy soils.

Characteristics: Timber is extremely hard and heavy, very strong and tough. Shock resistance high. Relatively easy to season considering its density. Material has been air-dried under cover in less than 120 days with some surface checking occurring. Slower rate of seasoning is likely to reduce degrade. Stock is difficult to work because of its density and hardness. Hard to saw and bore, but clean edges and holes can be obtained. Planes and finishes to a smooth surface and takes a high polish. Glues poorly. Probably resistant to termite and marine borer attack. Heartwood very resistant to preservative treatment. Good weathering and wearing properties. Relatively unstable in use. Useful for cogs, shafts, bearings, paving blocks and fishing rods.

References: 27, 38, 49, 76, 78, 83, 85.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20-36 (65-120)	0.5-0.8 (1½-2½)	1 9	10+ 9	S1 S1		1	S	1,3,4,5,6 7,9,10,11 21,23

Drimys granadensis (H)
(Syn: *D. winteri*)

Family:- *Winteraceae*

(WINTER TREE, CANJO)

Description: Sapwood is yellowish, merging gradually into the yellowish-red heartwood. Not lustrous. Growth rings distinct. Odour and taste not distinct. Grain straight to interlocked. Texture fine to medium, uneven. Pronounced figure on radial surfaces. Gum deposits occasionally present. Bole is cylindrical or slightly conical, buttressed at the base. Species is found in montane rain forests, sometimes in small stands.

Characteristics: Timber air-seasons moderately rapidly, but there is a pronounced tendency to surface checking due to high differential shrinkage. Works easily with hand and machine tools, planes to a good surface, and finishes fairly smoothly. Holds nails well. Weathering properties not satisfactory. Heartwood moderately resistant to impregnation with preservatives. Glues well and produces firm joints. Often used in the round. Produces low quality charcoal. Bark and leaves are used medicinally.

References: 1, 87, 146.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18 (60)	0.3-0.6 (1-2)	10 27	6+ 7	S5 S4	3-5	(4)	(S)	2,8,12, 13,15,17, 18,20,28

Enterolobium contortisiliquum (X) **Family:-** ***Mimosaceae***
(Syn: ***E. timbouva*****)**

(TIMBÓ)

Description: Sapwood is whitish-yellow in colour. Heartwood varies from rose to a uniform light reddish-brown with dark brown streaks. Texture is coarse and uniform. Grain is straight to somewhat wavy. Growth rings distinct with clear variation of early and late wood. Lustre is medium to high. Odour and taste not distinct. Bole is straight and clear of branches, from 9 to 15m (30-50 feet) in length. Species occurs in wet forests, along riverbanks and in rain forests at altitudes of 700 to 1000m (2300-3300 feet). A fast-growing species, suitable for ornamental planting and shade.

Characteristics: Timber is light, soft and flexible. Very easy to season without any great tendency to warp and check. Stock saws easily and works well with hand and machine tools. Takes paints and varnish readily. Nails and screws well and has good holding power. Wood is not resistant to decay but is durable in exposed situations and can be treated with preservatives. A good substitute for CEDRO (*Cedrela fissilis*).

References: 1, 4, 5, 6, 9, 16, 17, 20, 27, 32.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.8-1 (2½-3¼)	2 1	5+ 7	S7 (Below) S6	2	4	S	4,6,8,12, 15,17,18, 19,20,22, 24,30,31

Enterolobium cyclocarpum (H) **Family:- *Mimosaceae***

(GUANACASTE)

Description: Sapwood is yellowish-white. Heartwood brown with darker streaks and sharply defined from the sapwood. Lustre rather high. Grain is straight to interlocked. Texture medium to coarse. Odour and taste not distinct. Vessel lines prominently visible on longitudinal surfaces. Bark contains tannin. Species grows fast and is useful for shelter and shade. Generally promising for plantations in savanna-woodland areas.

Characteristics: Air-seasons rapidly with little tendency to warp and split. Timber works easily with hand and machine tools and finishes smoothly. Saws readily and 300 cutting angle should be used in planing with interlocked material. Blunting effect on edges moderate. Takes a good polish and glues well. Nailing properties good. Sawdust has an unpleasant odour and causes skin irritation in most individuals. Resistant to termites, but susceptible to pinhole borers. Good dimensional stability. Very durable in fresh water. Good substitute for SOUTH and CENTRAL AMERICAN CEDAR (*Cedrela* spp.). Pods are an excellent feed for cattle.

References: 1, 5, 10, 20, 27, 33, 35, 36, 55, 61, 66, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	1.2 (4)	8 21	6 5	S7 S7 (Below)	1-2	4	S	6,8,12,15 17,18,20, 22,29,30, 31,32

Eperua falcata **(H)** **Family:- *Caesalpiniaceae***

(WALLABA)

Description: Sapwood 30-50mm (1¼-2 inches) wide, greyish or brownish-white, and not clearly defined. Heartwood dull reddish-brown streaked with characteristic dark gummy exudations. No lustre. Texture medium to coarse. Grain usually straight. Growth rings distinct, marked by parenchyma. Unpleasant rancid odour when freshly cut but no taste. Quarter-sawn material shows pleasing markings when planed. Boles are straight and cylindrical, 12 to 20m (40-65 feet) long. Basal swellings or buttresses up to 2.4m (8 feet). Tree is gregarious in dry evergreen forests. Also found scattered in rain forests. A fast-growing species.

Characteristics: Timber is moderately hard and heavy, and very stiff and strong. Dries very slowly with marked tendency to warp and split. An initial period of air-seasoning prior to kiln-drying is necessary to avoid considerable degrade. Works moderately easily with machine and hand tools, but gum may build up on saw teeth and cutters, reducing clearances. Saws well with a 90mm (3½ inch) pitch and generous gullet. A kerosene-water mixture in a steady stream on the saw is recommended during sawing. Timber turns well, stains readily and polishes reasonably well after filling, but gum exudations may produce some detrimental effect on polishing. Glues well. Timber splits readily. Nailing and screwing properties not satisfactory - preboring advisable to prevent splitting. Moderate steam bending properties. Good wearing characteristics. Sapwood readily attacked by pinhole borers and termites. Heartwood resistant to termites, but prone to marine borer attack. Extremely resistant to preservative treatment.

References: 1, 8, 17, 20, 27, 31, 35, 38, 42, 43, 44, 52, 54, 64, 87, 92, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-27 (80-90)	0.5-0.9 (1½-3)	11 13	9+ 8+	S1 S2	2-3	1-2	S	1,2,3,4,5,6,7,13,20,21,23,25,28

Eschweilera sagotiana **(H)** **Family:-** ***Lecythidaceae***

(BLACK KAKERALLI)

Description: Sapwood 25 to 50mm (1-2 inches) wide, yellowish and clearly distinct from the heartwood which is pale brown with a pinkish tinge when freshly cut, turning to light greyish-brown or medium reddish-brown on exposure. Lustre low, grain generally straight, texture fine and uniform. Growth rings indistinct. Timber contains silica. Bole is well formed and up to 18m (60feet) long. Unbuttressed or slightly buttressed. Species is mainly found in rain forests.

Characteristics: Timber is very dense, tough and strong. Shock resistance high. Air-seasons moderately slowly with only slight warping and checking. Reported to be difficult to work but machines to a smooth surface. Dulling effect on tools is severe. Polishes well. Species does not glue readily. Pre-boring necessary for nailing. Very resistant to termite attack, as well as considerably resistant to marine borers. Highly durable to wear or abrasion. Steam bending qualities only fair. Suitable for pulp mill equipment such as beaters and bed plates. Heartwood extremely resistant to preservative treatment.

References: 1, 49, 66, 76, 77, 83, 90.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.6 (2)	11	10	S1	4-5	1	(N)	1,3,1,5, 6,10,21, 23,28

Eschweilera subglandulosa (H) **Family:- *Lecythidaceae***

(Syn: *Lecythis subglandulosa*)

(MANBARKLAK)

Description: Sapwood is 40 to 115mm (1½-4½ inches) wide, not well differentiated, creamy-tan in colour. Heartwood is greenish-yellow to olive-brown when freshly cut, darkening to brownish-buff upon drying. Lustre low to moderate. Grain typically straight. Texture fine and uniform. Wood contains a high percentage of silica. Butt of tree may be somewhat fluted and buttressed. Boles are usually straight, cylindrical, and up to 18m(60 feet) in length. Species is found in marsh forest and on low river banks.

Characteristics: Wood is extremely hard, tough and strong. Highly resistant to shock. Moderately difficult to air-season. Dries reasonably fast with slight warping, some end and surface checking and slight casehardening. Timber is difficult to work because of its high silica content and density. Cutting edges are rapidly dulled, but smooth surfaces can be obtained in all machining operations if tools are kept sharp. Difficult to glue. Good wearing characteristics. Very resistant to termite and marine borer attack. Heartwood extremely resistant to preservative treatment. Used for marine piling in teredo hazard areas.

References: 1, 38, 44, 50, 75, 80, 99.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5 (1½)	12,9	10	S1	5	1	(N)	1,2,3, 4,5, 6,21,23

Esenbeckia leiocarpa (H) **Family:** ***Rutaceae***

(GUARANTA)

Description: Sapwood and heartwood not demarcated. Wood is uniform yellow when freshly cut, darkening on exposure. Lustre high. Grain straight and wavy. Texture medium. Odour and taste not distinct. Bole is straight and clear of branches up to 10m (33 feet) in length. Species is found in mixed hardwood forests.

Characteristics: Timber is hard, heavy, strong and very elastic. Difficult to air-season on account of checking, but does not exhibit any great tendency to warp. Works easily, turns smoothly and takes an extremely high polish. Good weathering and wearing characteristics. Timber is suitable for textile equipment such as shuttles, loom harnesses, etc. Bark is used for quinine. Dust may cause dermatitis.

References: 1, 7, 9, 20, 27, 37.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
8-30 (26-100)	0.3-0.5 (1-1½)	1	9+	S1	3-5	2	(S)	1,3,5,6, 7,8,9,11, 20,21,23, 25,28

Eucalyptus camaldulensis **(H)** **Family:- *Myrtaceae***
(Syn: *E. rostrata*)

(RIVER RED GUM) (EXOTIC)

Description: Sapwood up to about 65mm (2½ inches) wide, grey in colour and clearly demarcated. Heartwood dark red when freshly sawn, turning to dark red-brown on exposure. Growth rings not distinct. Texture fine. Grain wavy or interlocked. Timber is much freer from kino pockets than is the native material. Often handsomely figured. Species tolerates a wide range of soils and climate including droughts and frosts. Thrives on alluvial soils or areas subject to flooding. Trees grow very rapidly on favourable sites but boles are sometimes crooked, even when grown in plantations. An ideal tree for farms, giving shelter and shade to stock.

Characteristics: Timber tends to distort seriously when seasoned rapidly and care must be taken to avoid it, especially as total shrinkage is augmented by collapse. Seasoning must be done slowly for best results. Plantation material saws easily and has generally good working properties. Finishes well with some tendency to raised grain. Polishes nicely. Glues well. Pre-boring advisable for nailing. Native timber is resistant to termites and decay but plantation stock is less durable as a rule. Sapwood permeable, heartwood extremely resistant to preservative treatment. Immature timber must be first treated with preservative when used in the ground. Makes good charcoal and firewood.

References: 18, 22, 36, 87, 107, 129, 132, 133, 135, 137, 138, 139, 141.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-36 (80-120)	1.2 (4)	5 1 40 (Native)	9+ 9 9	S3 S4 S4	5	3-4 3-4 3	S	1,3,5,6, 7,8,9,10, 11,12,15, 17,20,21, 23,30

Eucalyptus citriodora **(H)** **Family:- *Myrtaceae***

(LEMON-SCENTED GUM) (EXOTIC)

Description: Sapwood is white in colour. Heartwood varies from pale brown to grey-brown, sometimes to dark brown. Growth rings not well demarcated. Texture coarse. Grain may be straight, interlocked or occasionally wavy. Figure generally not prominent, but fiddleback is occasionally found. Species closely resembles SPOTTED GUM (*E. maculata*) and often hybridises with it. It is planted successfully in Argentina and in Brazil. Bole clean, but often forked or sinuous. Species tolerates a wide range of soils if not too sour, but prefers a deep soil and not too long dry periods. Susceptible to frosts, especially in the early stages of growth. Grows rapidly under favourable conditions. Species is very attractive, and makes a lovely ornamental tree in parks.

Characteristics: Timber is prone to checking in seasoning, particularly if back-sawn. Warping may occur in some material, and care must be taken to dry it satisfactorily. Kiln-drying of green material is not recommended. Timber saws fairly easily and machines well. Planes reasonably well, but interlocked grain may lift. Stains and polishes well. Glues satisfactorily. Rather difficult to nail, but takes screws fairly well. Native material is regarded as good steam bending timber. Plantation grown material yields a very good class of sawn timber, but not very suitable for pulpwood. Liable to termite and marine borer attack. Heartwood extremely resistant to impregnation, sapwood permeable. The leaves yield up to 1.5% oil, the citronella content of which is about 80%. Used for charcoal in some countries.

References: 18, 22, 36, 87, 128, 132, 135, 137, 138, 141, 144.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23-40 (75-130)	0.5-1.2 (1½-4)	1 40 (Native)	10 9+	S1 S2	5 3	2-3	S	1,3,4,5, 6,7,8,9, 10,11,12, 17,20,21, 22,23,24, 28

Eucalyptus globulus (H) Family: *Myrtaceae*

(BLUE GUM) (EXOTIC)

Description: Sapwood is pale coloured and usually distinct from the heartwood which varies from light grey to grey-brown to pink. Growth rings fairly distinct. Texture medium. Little figure present. Grain is often interlocked. Bole is straight but spiral grain commonly present. In South America, this species has been planted at altitudes ranging from 2000 to 4200m (6600-13800 feet). Tree is adaptable to a wide range of soils, grows rapidly and does well in cool moist climates. In Argentina, an 18 year-old plantation showed an average height of 40m (130 feet). Deep checking may develop in logs soon after felling. Species is grown usually on short coppice rotations. Often planted as a wind-break. Not suited to the subtropics and to either very cold or very dry climates.

Characteristics: Timber is somewhat difficult to season without degrade due to checking and collapse. Quarter-sawing is recommended and a combination of air-drying and kiln-drying may reduce degrade. Timber is fairly difficult to work due to interlocked grain. However, good machine finish and polish can be obtained. Glues satisfactorily. Material from native trees is reported to be resistant to marine borers. Prone to insect attack. Sapwood permeable, heartwood extremely resistant to impregnation. Selected stock suitable for poles and posts. Has proven rather inferior as firewood. Leaves are valuable source of medicinal oils.

References: 18, 22, 83, 87, 94, 129, 132, 133, 134, 135, 136, 137.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25-50 (82-164)	1-2 (3¼-6½)	1 5 10 40 (Native)	8+ 9+ 8 8+	S4 S2 S3 S3	5	3-4	S	1,2,3,4,5,6,7,8,9,11,12,13,15,17,18,20,21,22,23,27,28

Eucalyptus maculata **(H)** **Family - *Myrtaceae***

(SPOTTED GUM) (EXOTIC)

Description: Sapwood is white and distinct from the heartwood which may vary from almost white to pink but is commonly grey-brown coloured. Growth rings not distinct. Texture coarse and even. Grain usually straight or interlocked, occasionally wavy. Kino pockets sometimes present. Bole is characteristically straight and clean. Species is planted on a fairly large scale in Brazil, with good to excellent results, where heights up to 68m (223 feet) have been recorded for a 59 year-old plantation, at altitudes over 600m (2000 feet). Species has been planted with success in Argentina, obtaining better growth rates than LEMON-SCENTED GUM (*E. citriodora*). Tree prefers slightly moist, but well-drained soils. Can withstand drought but is not hardy to frost.

Characteristics: Timber seasons well but care is necessary to avoid checking. Some slight collapse may develop. Saws readily with little splitting. Works well and finishes to a good clean surface. Pre-boring necessary in nailing. Stains and polishes well. Glues satisfactorily. Reported to be susceptible to termite and pinhole borer attack. Heartwood extremely resistant to preservative treatment, sapwood permeable. Material is regarded as a good steam bending timber. Young trees are often utilized for poles. Sometimes used for charcoal. Makes very good fuel. Clear material makes good flooring for ballrooms and badminton courts.

References: 8, 18, 22, 36, 83, 87, 107, 128, 132, 135, 138, 141, 144.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36-70 (120-230)	0.9-1.5 (3-5)	1 40 (Native)	9 9+	S2 S2	5 4	3 2-3	S	1,3,4,5, 6,7,8,9, 10,11,12, 17,20,21, 23,27,28

Eucalyptus pilularis (H) Family:- *Myrtaceae*

(BLACKBUTT) (EXOTIC)

Description: Sapwood is variable in width, pale coloured and not clearly demarcated. Heartwood is pale brown to brown with a pinkish tinge. Texture moderately fine. Grain usually straight. Growth rings not distinct. Small gum veins and spiral grain sometimes present. Bole almost perfectly straight and clean. A native of Australia, the species seems to grow well in areas with wet sub-tropical or warm temperate climates and uniform summer rainfall. In Brazil, a 52 year-old plantation had a mean height of more than 60m (197 feet) and diameters of up to 850mm (33½ inches), at an altitude up to over 600m (2000 feet). Has the ability to grow on rather poor soils, but prefers deep loam. A very fast-growing species under good conditions.

Characteristics: End-splitting of logs soon after felling is common. Timber is very prone to check during drying, when collapse and honeycombing may also occur. Air-drying before kiln-drying is advisable. Works fairly well with all hand and machine tools. Planes to a smooth surface. Takes stains readily and a high polish. Glues well. Liable to termite and marine borer attack. Heartwood extremely resistant to impregnation, sapwood moderately resistant. Young, rapidly grown trees might be used as a substitute for softwood in case-making. A good source of charcoal.

References: 8, 18, 36, 87, 107, 128, 132, 138, 141, 144.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36-61 (120-200)	0.8-2 (2½-6½)	1 40 (Native)	9 9	S3 S2	4-5	2	N	1,3,4,5, 6,7,9,10, 11,12,13, 17,20,21, 22,23,27, 28,29

Eucalyptus resinifera **(H)** **Family:-** ***Myrtaceae***

(RED MAHOGANY) (EXOTIC)

Description: Sapwood pale and well demarcated from the heartwood which is deep red in colour. Texture medium to coarse. Grain usually interlocked. Occasionally straight and supple figure sometimes present. Species is a native of Australia, where it occurs at altitudes from sea level to over 600m (2000 feet). In Brazil, plantations have satisfactory growth rate and trees are uniform and of good form. Good results have also been reported from Argentina. Species tolerates dry and wet areas, but it is not frost resistant. Prefers light, moderate fertile, sandy soils with adequate moisture. When well-grown trees are fairly ornamental.

Characteristics: Timber is hard, strong and tough but splits easily. It may be dried without much degrade, but checking and warping is likely to occur. Slight collapse may also occur. Material saws cleanly and works well with hand and machine tools. Planes to a good surface and polishes well. Fairly resistant to termite attack. Sapwood permeable, heartwood extremely resistant to impregnation with preservatives. Used for charcoal, but not a good firewood. Often used in the round.

References: 18, 36, 87, 107, 128, 129, 132, 135, 137, 138, 141, 144.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-45 (100-150)	0.9-1.5 (3-5)	1 40 (Native)	8+ 9+	S3 S2	5 3	3	S	1,2,3,4, 5,6,7,8, 12,13,15,17,20,21,22,23,28

Eucalyptus robusta **(H)** **Family:- *Myrtaceae***

(Syn: *E. multiflora*)

(SWAMP MAHOGANY) (EXOTIC)

Description: Sapwood is pale brown in colour and well demarcated. Heartwood is light red to reddish-brown, often with brown streaks. Growth rings not distinct. Texture coarse. Grain fairly straight to interlocked. A native of Australia, the species has grown well in Brazil, though not as fast as SYDNEY BLUE GUM (*E. saligna*). Good results have been recorded in Argentina on wet, poorly-drained lowland areas. Species is more adaptable to wet tropical zones, than arid areas, but does quite well on fairly dry sites and apparently is moderately drought-hardy but not very frost resistant. Makes a fine avenue display and lends itself well to use in shelterbelts.

Characteristics: Timber is hard, moderately heavy and strong. Difficult to season without often developing distortion and splitting. Sawing and machining characteristics generally good. Finishes and polishes well. Nails satisfactorily but pre-boring necessary. Takes screws well. Glues well. Takes paints and waxes satisfactorily. Susceptible to snout beetle attack. Prone to occasional termite attack. Sapwood permeable, heartwood. extremely resistant to preservative treatment. Used for charcoal but is rather inferior as firewood.

References: 18, 22, 36, 87, 100, 107, 128, 129, 135, 137, 138, 144.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-27 (80-90)	0.9-1.2 (3-4)	1 40 (Native)	8+ 9	S3 (S3)	5 4	2	S	1,3,5,6, 7,8,11,12 13,20,21, 22,23

Eucalyptus saligna **(H)** **Family:** ***Myrtaceae***

(SALIGNA GUM, SYDNEY BLUE GUM) (EXOTIC)

Description: Sapwood not always clearly demarcated from the heartwood, which may vary from almost white in young trees through all shades of pink to dark red, in old trees. Usually pinkish coloured when freshly sawn, darkening to brown on exposure. Growth rings not distinct. Grain usually straight or slightly interlocked, often producing an attractive figure. Texture coarse. As an exotic, the species has shown a very good growth rate, especially under moist and temperate climates. Boles are almost cylindrical, straight and long. Tree coppices well, but is sensitive to frost. In Brazil, heights of 60m (197 feet) and diameters of 800mm (31½ inches) have been recorded at 50 years of age. A suitable tree for parks arid large gardens for ornamental purposes. Sometimes used for shelter and windbreak planting.

Characteristics: Properties and strength vary with age and density. Timber seasons easily with some tendency to split. Plantation grown material is generally easy to work. Planes to a smooth surface, takes a good polish and glues well. Timber bores cleanly. Stains and paints satisfactorily. Good wearing properties. Prone to termite and marine borer attack. Sapwood permeable, heartwood resistant to preservative treatment. Makes good firewood and charcoal. Leaves yield oil. Immature timber from 12 year old or younger trees is often used as a substitute for pine.

References: 8, 18, 22, 87, 107, 129, 134, 135, 137, 138, 141.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40-48 (130-160)	1.2-1.8 (4-6)	1 (Immature) 5 40 (Native)	7+ 9+ 9	S4 S2 S3	5	3	S	1,2,3,4, 5,6,7,8, 9,10,12, 13,15,17, 18,20,21, 22,23,27

Eucalyptus tereticornis **(H)** **Family:** ***Myrtaceae***

(Syn: ***E. umbellata*****)**

(FOREST RED GUM) (EXOTIC)

Description: Sapwood is cream or grey in colour. Heartwood uniform pink to dark red. Growth rings not very distinct. Texture rather fine to medium, uniform. Grain wavy or interlocked. The species is a native of the east coast of Australia and New Guinea. Has been extensively planted in Brazil, but is likely to produce less volume of timber than SYDNEY BLUE GUM (*E. saligna*) and ROSE GUM (*E. grandis*). Species generally prefers moist sandy loans or gravel soils. Is remarkably drought-hardy and frost-resistant. Trees may be attacked by snout Beetle (*Gonipterus scutellus*). In Brazil, an 18 year-old plantation attained a mean height of 25m (82 feet) on good soil.

Characteristics: Timber is fairly tough and hard. Seasons fairly well, but surface checking may develop. Air-drying stacks must be protected against severe drying conditions. Stock saws and works well with all tools but interlocked grain may cause trouble in planing. Polishes and glues well. Nail holding power is good. Liable to termite attack. Sapwood permeable, heartwood resistant to impregnation. Good wearing and weathering characteristics. Timber is not very suitable for paper making, but provides good sawn material and is one of the best for charcoal production.

References: 18, 36, 83, 87, 107, 128, 129, 132, 135, 137, 138, 141, 143.

TREE		PROPERTIES -						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-45 (100-150)	0.9-1.8 (3-6)	1 5 40 (Native)	9+ 8+ 9+	S2 S3 S3	5 5 4-5	2	S	1,2,3,4, 5,6,7,8, 9,10,11,12,13,15,17,18,19,20,21,22,23,25,27,28,29

Eucalyptus viminalis **(H)** **Family:- *Myrtaceae***

(MANNA GUM) (EXOTIC)

Description: Sapwood and heartwood not well demarcated. Timber varies in colour from pale yellow to pinkish-white. Growth rings may be distinct in some specimens. Texture coarse. Grain straight to often interlocked. Tree is somewhat variable in form, but under favourable conditions may develop a long straight bole. Species has been a marked success in southern Brazil at altitudes above 900m (3000 feet). Will grow on a variety of soils and tolerates brackish conditions. One of the hardiest eucalypts and exceedingly frost resistant. Tree is useful for farm planting, for shelter, shade and ornamental purposes.

Characteristics: Timber air-seasons moderately rapidly in small dimensions, but is inclined to check and warp. Collapse may occur, but timber can be reconditioned satisfactorily. Air-drying prior to kiln-drying is recommended. Stock works easily and planes fairly well but is fairly difficult to saw. May split in nailing and screwing - pre-boring advisable. Reported to peel without difficulty. Liable to termite and marine borer attack. Sapwood generally permeable, heartwood extremely resistant to impregnation. Timber is useful for fuel.

References: 18, 36, 87, 107, 128, 129, 132, 137, 138, 139, 140, 141.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-36 (100-120)	0.9-1.2 (3-4)	1 40 (Native)	8 8+	S4 S4	5	4	S	1,2,3,4,6, 7,8,9,10, 12,13,15, 17,20,23

Eucryphia cordifolia (H) **Family:- *Eucryphiaceae***

(ULMO)

Description: Sapwood paler in colour and not well defined from the heartwood which is reddish- or greyish-brown, sometimes variegated. Lustre rather high. Grain generally straight. Texture fine and uniform. Growth rings distinct producing an attractive figure on back-cut surfaces. Bole may be 20 to 25m (65-82 feet) long. Species occurs in sub-tropical and temperate rain forests, from the lowlands to the mountains and the edge of glaciers.

Characteristics: Timber is moderately strong and hard. Dries reasonably rapidly and well without checking, but liable to warp badly when tension wood present. Stock works easily with hand and machine tools and finishes very smoothly. Peels and polishes well. Prone to insect attack. Fibre saturation point normal to moderately high. Stable when dry. Reports on durability are conflicting. A good softwood substitute for certain purposes, and a very good bending timber. Bark is used for the extraction of tannin and the root wood for tobacco pipes.

References: 1, 8, 20, 27, 35, 43, 47, 94

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	0.4-0.9 (1¼-3)	10	7	S6	4-5	(3-4)	(N)	2,4,7,8, 12,17,20, 21,23,28

Euxylophora paraensis (H) **Family: *Rutaceae***

(BRAZILIAN SATINWOOD)

Description: Sapwood yellowish-white, not sharply demarcated from the uniform bright yellow heartwood. Lustre high. Grain straight to interlocked, sometimes irregular. Texture medium. Bole may be 6 to 8m (20-26 feet) in length. Species occurs in upland forests or in areas not subject to flooding.

Characteristics: Timber is moderately strong and dense. Seasons fairly well. Moderate resistance to cutting and blunting effect on cutting edges. Rather difficult to work by some hand or machine tools but turns and carves reasonably easily. Takes a lustrous finish. Resistant to termite attack. Used for decorative cabinet work and flooring. Stable in service.

References: 1, 5, 17, 20, 27, 31, 35, 37, 61, 66, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25-30 (82-100)	0.4-0.8 (1¼-2½)	1	8+	S4	4-5	3-4	(S)	2,4,8,9, 10,17,20, 24,27,28

Fagara pentandra **(H)** **Family:** ***Rutaceae***

(PRITIJARI)

Description: Sapwood 30 to 50mm (1¼-2 inches) wide, yellowish-white and not always sharply demarcated from the pale golden or greenish-yellow heartwood, which slightly darkens on exposure. High, satiny lustre. Texture rather fine. Grain straight, sometimes slightly interlocked. Growth rings usually distinct. Bole is cylindrical with small conical spines. Species is found in rain and marsh forests, mainly in coastal plains.

Characteristics: Timber is moderately hard and heavy, tough and resilient. Seasons well without difficulty. Good sawing and working properties, but grain may lift occasionally in planing. Finishes smoothly and polishes nicely. Glues satisfactorily. Heartwood resistant to preservative treatment, sapwood permeable. Moisture movement low. Probably a good bending timber. Susceptible to marine borer attack.

References: 44, 50.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.4 (1¼)	12	9	(S3)	(3)	3	S	8,12,17, 20

Fitzroya cupressoides (S)

Family:- *Cupressaceae*

(Syn: *F. patagonica*)

(ALERCE)

Description: Sapwood is thin and whitish-yellow in colour. Heartwood is pale to dark reddish-brown, often with alternate light and dark streaks. Grain typically straight. Texture fine and uniform. Growth rings clearly demarcated by contrasting bands of latewood and earlywood. Bole straight, almost cylindrical and clear of branches, and up to 25m (82 feet) in length. Species is common in low swampy areas. It grows also at higher elevations but never above 1000m (3300 feet), usually in dense, pure stands. Grows slowly and is very long-lived, sometimes reaching 3000 years of age. Centre of large trees often attacked by heart rot. Bark contains resin.

Characteristics: Timber is similar in both appearance and properties to CALIFORNIAN REDWOOD (*Sequoia sempervirens*). Seasons readily with little or no degrade, but splitting may occur. Moisture movement small. Works easily with all hand and machine tools, and good finish can be obtained with sharp cutting edges especially in working the end grain. Stock is free from knots and other defects. A first-class joinery wood. Material finishes smoothly and takes varnish and paint very well. Glues satisfactorily. Reported to be resistant to insect attack. Durable in fresh water. Heartwood permeable to preservative treatment. Good fuel. The inner bark is used for caulking boats and ships, and also for insulation purposes.

References: 1, 3, 4, 5, 6, 11, 27, 35, 47, 53, 64, 88, 91, 93, 94, 98, 110, 123

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
50 (164)	0.9-1.5 (3-5)	10 2	6+ 7	S7 S7	3	2-3	N	2,6,8,10, 15,16,17, 20,22,23, 24,25,26, 27,30,31

Genipa americana **(H)** **Family:** ***Rubiaceae***

(JAGUA)

Description: Sapwood is cream coloured, merging gradually into the heartwood which is pale yellowish-brown, sometimes with pinkish tinge and occasionally with darker streaks. Lustre medium. Grain straight to irregular. Texture fine. Growth rings not distinct. Back-sawn surfaces frequently show a ribbon figure. Bole is straight, cylindrical and 15 to 21m(50-70 feet) in length. Species is common in lowlands, occurs sparingly in virgin forests but most frequently around towns and villages,where it is planted as a shade tree. Also found in open forests or at the edge of savannas.

Characteristics: Timber is moderately hard and heavy, strong and resilient. Shock resisting properties very good. Air-seasons slowly with only slight warping. Green 25mm (1 inch) timber may season to 20% moisture content in 7 to 8 months. Subject to blue stain during seasoning. Stock works easily giving excellent results in machining operations. Turns and carves easily. Glues satisfactorily. Takes all types of stains and finishes without difficulty. Nails and screws with difficulty but has good holding power. Very susceptible to pinhole borer and termite attack. Very suitable for all types of bent work. Wearing characteristic good. A substitute for EUROPEAN ASH (*Fraxinus excelsior*). Leaves and seeds yield a dark blue or black dye used for colouring cloth and protection against insect bites. Fruits edible.

References: 1, 9, 20, 27, 33, 45, 49, 66, 79, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-33 (90-110)	0.6 (2)	9 1 8	9 9 8	S3 S2 S3	3	(3-4)	(S)	4,8,9,10, 11,12,15, 17,20,28

Gossypiospermum praecox (H) **Family:- *Flacourtiaceae***

(MARACAIBO BOXWOOD)

Description: Wood is lemon or nearly white in colour with little or no difference between sapwood and heartwood. Lustre high. Grain usually straight. Texture very fine and uniform. Growth rings not always clearly demarcated. Odour and taste not distinct. Bark when freshly cut exudes a dark gummy substance. Bole is well formed and cylindrical, varying from 3 to 5m (10-17 feet) in length. Species usually found on dry, chalky or rocky slopes.

Characteristics: Blue stain common in logs stored under humid conditions. Timber is hard and heavy. Must be seasoned with care. Dries very slowly with a tendency to split and check. Can be worked without difficulty. Easy to carve and turn and finishes very smoothly taking a high polish. Glues and stains well. Weathering properties not satisfactory. Good jointing timber and also good substitute for EUROPEAN BOXWOOD (*Buxus sempervirens*). Used principally in manufacture of musical instruments and rulers.

References: 1, 3, 8, 10, 14, 20, 27, 35, 47, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
11 (36)	0.4 (1¼)	9	9	(S3)	1-2	(2)	(N)	8,9,10, 12,14,16, 17,20,24, 27,28

Goupia glabra (H) **Family:- *Celastraceae***

(KOPIE, CUPIUBA)

Description: Sapwood is light pink, brown or yellowish, about 50mm (2 inches) wide and distinct from the light reddish-brown or red-brown heartwood, often with fine blackish streaks. Moderately lustrous. Texture medium to coarse and uniform. Grain straight or interlocked. Wood when green has a fetid odour and disagreeable taste that largely dissipates on drying but still apparent in dry material. Boles 12 to 20m (40-65 feet) long, cylindrical to somewhat flattened and buttressed. Species is found in rain forests, lower montane forests and marsh forests, usually on sandy or loamy soils.

Characteristics: Air-seasoning moderately difficult. Dries at a medium rate with slight warping, checking and casehardening. Should not be dried too fast. Reasonably difficult to work. Saws well with a moderate dulling effect oncutting edges. Smooth surfaces are obtained in sawing, boring and turning. In planing, a cutting angle of 15° is required to prevent tearing on quarter-sawn stock. Glues well. Stains and polishes satisfactorily. Coarse material requires a filler. Liable to split when nailed. Resistant to termite attack but not to marine borers. Moisture movement rather high but fairly stable in use. Slices satisfactorily.

References: 8, 13, 15, 20, 35, 38, 43, 44, 63, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	0.8-1.2 (2½-4)	1,12 9	9 9	S4 S3	3-4	2	(S)	1,2,3,4, 5,6,7,8, 11,12,20, 21,23,28

Grevillea robusta (H) Family:- *Proteaceae*

(GREVILLEA, SOUTHERN SILKY OAK) (EXOTIC)

Description: Sapwood is about 40mm (1½ inches) wide; white or straw coloured. Heartwood distinctly pink or light red when freshly cut, turning pale brown or red-brown on exposure. Texture medium to coarse. Grain may be straight or wavy. Growth rings not distinct. Large rays give the wood an attractive figure on both the quarter-cut and back-cut surfaces. Vessels contain some red deposits. Indigenous to Australia in the rain forest areas. In Venezuela, an 8 year old experimental plantation had a mean height of 18m (60 feet) and mean diameter of 190mm (7½ inches), with strong branching and a tendency to fork. Species grows particularly well in high rainfall areas, but is also drought-resistant. Has been cultivated as an ornamental, and as a shade tree for coffee and tea. Good rates of growth have been reported from Argentina, Brazil and Peru. Species prefers areas of moderate altitude.

Characteristics: Air-seasons slowly with some tendency to distort, check and end split. Low temperatures recommended in kiln-drying to avoid severe twisting. Timber saws easily, apart from gumming up the saw-blades. Stock moulds easily and cleanly, but 10° cutting angle required to obtain good finish on quarter-cut faces. Mortising and chiselling properties usually good. Material needs scraping to ensure a good polish. Stains readily. Takes nails easily but splitting may occur. Nail holding power medium to low. Slices readily. Liable to marine borer and termite attack. Heartwood is regarded as moderately resistant to pressure impregnation, sapwood is permeable. Sawdust may cause skin inflammation.

References: 8, 18, 19, 22, 36, 43, 46, 87, 107, 116, 128, 142

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.9 (3)	1 20 40 (Native)	7+ 7 7+	S6 S7 S5	2-4	3-4	S	2,3,4,8, 11,12,15, 17,18,20, 25,27,28, 30

Guaiacum officinale (H) Family:- *Zygophyllaceae*

(LIGNUM VITAE)

Description: Sapwood is narrow, pale yellowish, and sharply differentiated from the dark greenish-brown or nearly black heartwood which becomes even darker after exposure. Grain is interlocked with a characteristic oily feel. Texture fine and uniform. A slight scent is evident when the timber is heated or rubbed. Occasionally figured. Timber contains resin (Guaiac). Boles usually up to 3m (10 feet) in length. Species occur on drier coastal plains and exposed low rainfall areas.

Characteristics: Timber is one of the hardest and heaviest known. Reported to be refractory in drying, and considerable care is required to avoid shakes and splitting. Stock dries very slowly. Extremely difficult to work with-hand tools and very hard to saw and machine. Dulling effect on cutting edges is not very severe, owing to its oily nature. In planing, a cutting angle of 15° or less is advisable to prevent raised or chipped grain. In sawing, a fine tooth pitch and limited hook are necessary to prevent considerable vibration. Nails, screws, and glues with difficulty. Turns very well and takes a high polish. Sapwood moderately resistant to termites. Heartwood practically immune to termites and teredo, and highly resistant to other marine borers. Acid resistant. Unsuitable for bending. Timber is famous for its self-lubricating properties. Wearing qualities excellent. Extremely resistant to preservatives. Used principally for bearings and ships' propeller bushes, and for cotton gins, polishing sticks and rollers in the textile industry.

References: 1, 3, 8, 14, 20, 23, 34, 35, 36, 38, 47, 53, 57, 87, 104, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
9 (30)	0.3 (1)	29	10+	S2	5	1	N	6,10 16,28

Guarea trichilioides (H) Family: *Meliaceae*

(AMERICAN GUAREA)

Description: Sapwood is whitish to brownish but not clearly demarcated from the reddish or dark brown coloured heartwood. Lustre rather low, texture medium and grain straight. Wood when fresh has an aromatic odour, but no distinct odour and taste is evident in seasoned material. Bole is straight, cylindrical and up to 15m (50 feet) in length. Species is found in dry medium loam among shrubs and low trees of secondary formation, sometimes in the vicinity of streams or in dense forests not subject to floods. Frequently planted for shade and protection in coffee plantations.

Characteristics: Stock seasons slowly with moderate warping. 25mm (1 inch) timber requires about 8 months under cover to air-season to 19% moisture content. Stock saws and machines easily and well in all operations except in boring, where it tends to tear and crumble. Takes high lustrous finish with either varnish or lacquer. Screwing properties good. Timber has good resistance to termites. Heartwood extremely resistant to impregnation with preservatives, sapwood responds well to pressure treatment. May be suitable for veneer but requires considerable steaming for either rotary or slicing operations. Wood is reputed to be stable after manufacture.

References: 1, 45, 66, 79, 83, 95.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.7 (2¼)	9	8	S3	3-4	(2)	(S)	1,2,8,12, 17,20,28

Guilandina echinata **(H)** **Family:- *Caesalpiniaceae***

(Syn: *Caesalpinia echinata*)

(BRAZILWOOD, PERNAMBUCO)

Description: Sapwood is narrow, yellowish or whitish and clearly defined. Heartwood uniform bright orange colour when freshly cut, turning to dark red or reddish-brown on exposure. Lustre high. Grain variable, straight or interlocked. Texture fine and even. Bole usually slender and clear of branches for 15 to 18m (50-60 feet) in length. Species is found in coastal mixed hardwood forests. Has been planted for ornamental purposes.

Characteristics: Timber is very hard and heavy, strong and resilient. It checks considerably in drying, but does not warp much if dried slowly. Moderately difficult to work on account of its hardness, but finishes smoothly and takes an extremely lustrous polish. Turns and carves without difficulty. Very resistant to insect attack and very durable in damp situations. Used almost exclusively for the manufacture of violin bows. Timber yields a dye. Bark is used for tannin extraction. Sawdust may cause headache, nausea and visual disturbance, but appropriate ventilation in workshop can eliminate this problem.

References: 1, 9, 17, 20, 32, 35, 47, 83, 95.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5-0.8 (1½-2½)	1	10	(S1)	(5)	1	S	1,2,3,4, 5,6,7,8, 14,20,21, 24,28

Haematoxylon campechianum (H) **Family:- *Caesalpiniaceae***

(LOGWOOD)

Description: Sapwood is narrow and white or yellowish in colour. Heartwood is bright orange to red, sometimes with darker streaks turning dark reddish-brown with age. Lustre high, golden. Odour fragrant in freshly cut wood, taste sweetish. Grain interlocked. Texture medium to fine, fairly even. Growth rings barely distinct. Tree often has a gnarled or contorted bole. Species is found in swamp and in dry land forest, but does best in dry areas. Native of tropical America, but widely cultivated in other parts of the tropics.

Characteristics: Timber is very hard and heavy, strong but brittle. Rather difficult to work by hand tools. Somewhat hard to saw across the grain. Finishes very smoothly and polishes well. Turns and carves easily. Must be pre-bored for nailing and screwing, but holding power good. Good weathering characteristics. Makes good firewood. Use for purposes other than dye extraction is largely restricted by the irregular form of the stems. Timber also has certain medicinal uses.

References: 1, 10, 19, 20, 36, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15 (50)	0.6 (2)	8,9,30	10	(S2)	(5)	2	(S)	9,17,21, 27,28

Hernandia sonora (H) **Family:- *Hernandiaceae***

(HOAHOA, MAGO)

Description: Sapwood and heartwood not distinct. Wood is greyish-white with occasional faint olive coloured streaks. Darker coloured pores are visible on end-grain, and appear on longitudinal surfaces as numerous brown dots. Timber has low lustre, medium to coarse texture and straight grain. Growth rings indistinct. Bole poorly formed, strongly tapered and up to 18m (60 feet) in length. Low buttresses present. Species is found in marsh forests and on river banks.

Characteristics: Timber air-seasons satisfactorily. Dries rapidly with only minor warping and without any apparent checking. Green 25mm (1 inch) timber may be air-seasoned to about 17% moisture content in months, under cover. Stock works easily with both hand and machine tools but develops woolly surfaces in most operations. Reported to dull saws and knives rather quickly. Very sharp and thin cutting edges recommended. Takes nails and screws readily without splitting. Difficult to finish and polish due to its softness. Timber is very susceptible to termites and marine borers. Sapwood and heartwood permeable to preservative treatment. A good substitutefor heavier grades of BALSA (*Ochroma pyramidale*). Used for canoes, fishing floats and model making.

References: 45, 49, 66, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6 (2)	11 23	4 5	S7 (Below)	2	4	S	12,13,15, 17,19

Hevea brasiliensis **(H)** **Family:- *Euphorbiaceae***

(PARA RUBBER TREE, CAOUTCHOUC TREE)

Description: Sapwood and heartwood are not clearly demarcated. Wood is whitish when freshly cut, turning light brown or pale straw on exposure, sometimes tinged with pink. Typical sour smell. Grain straight to wavy. Texture moderately coarse to coarse, even. No figure. Tension wood may be present. Tree contains abundant white or yellowish latex that yields good quality rubber. Fresh latex consists of rubber particles, proteins, resins, sugars, tannins, alkaloids, etc. Growth rings indistinct. Bole is well-formed, usually somewhat tapered, and clear for about 9 to 14m (3O-46 feet) in length. Species occurs in tropical evergreen forests, often in periodically flooded areas. Occasionally, larger specimens can be found on well-drained plateaux. It is planted in most tropical countries of the world.

Characteristics: Rapid extraction, conversion and seasoning are necessary to prevent deterioration from decay and blue stain. End splitting is likely to occur. Boards up to 25mm (1 inch) air-dry in approximately 2 months under cover. Prone to warping and twisting, unless stacked carefully and dried under cover. Timber is reported to saw fairly well. Its blunting effect on tools is moderate, but rather pronounced on sawteeth due to gummy deposits. Sharp edges are necessary to avoid woolly surfaces. Planes to a smooth surface. Stock is easy to work and takes a highly lustrous finish. Some tendency to split may occur on nailing and screwing - pre-boring necessary. Too soft for turnery. Glues well. Impact properties low. Very susceptible to marine borer, pinhole borer, termite and longhorn beetle attack. Suitable for making high grade standard and super hardboards. Seeds are toxic to man until cyanic poisons are removed by boiling. The oil obtained during this operation can be used for illumination, soap, etc.

References: 1, 19, 36, 79.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	1 (3¼)	36 (Exotic)	6+	S6	(4)	4	S	2,4,8,12, 13,15,17, 18,20,22

Hieronyma alchorneoides **(H)** **Family:-** ***Euphorbiaceae***

(URUCURANA)

Description: Sapwood is greyish-pink in colour and often not clearly demarcated. Heartwood usually pale reddish-brown to very dark brown, often exuding a blackish sap when freshly sawn. Lustre low. Texture medium to coarse, sometimes uneven. Grain irregular. Odour and taste indistinct. Clear cylindrical boles may be up to 15m (50 feet) long, above the massive buttresses 1.8m (6 feet) high. Species is found in mixed hardwood forests of coastal mountains and in wet, marshy sites.

Characteristics: Timber requires care in seasoning to prevent warping and checking. Working properties generally good. Smooth surfaces are obtained in boring and mortising. Stock turns and carves nicely but planes fairly poorly. Fair amount of filler needed to secure a good finish. Difficult to split. Glues well. Reported to be resistant to marine borer and moderately resistant to termite attack. Difficult to treat with preservatives. Stable when seasoned. Suitable for high class cabinet work. Timber contains tannin.

References: 1, 7, 9, 16, 38, 87, 127, 145.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.9 (3)	1 8	8+ 8	S3 S3	5	2-3	(S)	1,2,3,4, 6,7,8,12, 13,17,20 21,23,24 28

Hieronyma laxiflora **(H)** **Family:- *Euphorbiaceae***

(SURADAN)

Description: Sapwood is 25 to 50mm (1-2 inches) wide and pink in colour. Heartwood reddish-brown to dark red. Lustre low. Grain interlocked giving a striped figure. Texture moderately coarse. Growth rings marked by differences in colour and appear on tangential surfaces as a series of parabolic markings. Timber contains deposits of calcium oxalate. Boles clear up to 21m (70 feet). Moderate form. Buttresses generally up to 1.2m (4 feet) surrounding the base of the tree. Species is found in lowland rain forests and in secondary formations.

Characteristics: Timber dries rapidly but with defects in the form of moderate twisting and surface checking. Slight end checking and case-hardening may also occur. A slower rate of drying is recommended to minimize degrade. Stock is moderately difficult to work. Planes well but requires considerable amount of sanding for a good finish. Difficult to split. Glues well. Moderately resistant to termite and resistant to marine borer attack. Reasonably good steam bending properties. Suitable for marine piling and construction.

References: 38, 49, 81, 83, 90.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	0.9 (3)	12 9	9 9	S3 S2	5	2	(S)	1,2,6,7, 8,11,12, 17,20,21, 23

Humiria balsamifera (H) **Family:- *Humiriaceae***

(TAURONIRO, OLOROSO)

Description: Sapwood. about 40 to 50mm (1½-2 inches) wide, light brown and poorly demarcated from a light brown to reddish-brown heartwood. Lustre medium. Grain straight to interlocked. Texture medium. Growth rings indistinct. No odour or taste. Boles are cylindrical and clear of branches for 18 to 21m (60-70 feet). Unbuttressed. Species is found in marsh, dry evergreen and savanna forests, generally on sandy soils.

Characteristics: Air-seasons rapidly with slight surface and end checking, and moderate warping. Casehardening may also occur. Material must be seasoned at a moderate rate to reduce degrade. Reasonably difficult to work. Saws well and planes smoothly, but interlocked stock tends to chip in planing. Inclined to be splintery. Does not turn well but can be bored satisfactorily. Resistant to termite but susceptible to marine borer attack.

References: 1, 20, 38, 49, 66, 81, 90.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-36 (90-120)	0.5-0.8 (1½-2½)	12	9	S2	5	2-3	(S)	1,2,3,4, 5,7,8,9, 11,12,17, 18,20,21, 23

Hura crepitans (H) Family:- *Euphorbiaceae*

(HURA, POSSUM WOOD)

Description: Sapwood 50 to 100mm (2-4 inches) wide, yellowish-white not generally sharply demarcated, but merging gradually into the heartwood which is light brown, yellowish-brown or pale olive grey with darker markings. Texture fine to moderately fine, uniform. Grain straight to interlocked. Growth rings indistinct. Odour and taste not distinct. Lustrous. Boles are cylindrical and straight with swollen base or small thick buttresses. Clear length from 12 to 23m (40-75 feet). Frequently occurs in coastal plains, on ridge-slopes, and edges of swamps. Forms pure or nearly pure stands in some places. Often planted for shade and decorative purposes. Bark contains latex that is exceptionally irritating to the eyes.

Characteristics: Air-seasoning of timber is moderately difficult. Tends to dry rapidly, which prevents mould and sap-stain development, but causes variable amounts of warping arid checking. Timber produces woolly surfaces when sawn green, but machines well when dry with no blunting effect on cutting edges. Torn grain is frequent in planing, particularly on quarter-cut surfaces. Finishes and stains well. Glues readily. Nails and screws satisfactorily. Can be peeled and sliced. Moderately resistant to white-rot and brown-rot fungi. Very susceptible to damage by termites and marine borers. Heartwood shows low resistance to impregnation with preservatives. Excellent weathering properties, but does not wear well. Oil from the seed is suitable for linoleum manufacture.

References: 1, 5, 7, 8, 15, 20, 35, 38, 43, 44, 46, 47, 48, 50, 53, 61, 76, 78, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-40 (90-130)	0.9-1.5 (3-5)	9,12,26 1	6 5+	S7 S7	2	3	S	8,10,12, 15,17,18, 20,22,23, 27,31,32

Hymenaea courbaril (H) **Family:- *Caesalpiniaceae***

(COURBARIL, ALGARROBO)

Description: Sapwood is greyish-white and usually wide. Heartwood red to orange brown when fresh, darkening after exposure to a reddish-brown, often with darker streaks. Sharply differentiated from the sapwood. Lustre fairly high. Grain interlocked, occasionally straight. Texture medium to coarse. Odour and taste not distinct. Growth rings demarcated. Bark contains a yellowish or reddish gummy substance. Boles are well formed and usually free of branches for 18 to 24m (60-80 feet). Buttresses or swollen base present in large trees. Species is best adapted to sandy, well-drained soils and reaches its best development on ridges or slopes and high river banks. Prefers open, not too humid sites.

Characteristics: Timber is very strong, tough and hard. Shock resistance high. Air-seasoning moderately difficult, drying at a medium to fast rate with degrade such as slight checking, warping, and casehardening. Reasonably difficult to saw and machine because of its high density, but can be planed to a smooth surface. Turns satisfactorily. Finishes smoothly but does not take high polish. Glues well. Steam bending properties excellent. Takes nails badly but screw holding power good. Heartwood very resistant to white-rot and brown-rot fungi. Highly resistant to termites but readily damaged by marine borers. Rated as impermeable to preservative impregnation. Weathering properties relatively poor, but highly wear-resistant.

References: 1, 2, 5, 9, 10, 13, 20, 23, 27, 35, 38, 42, 44, 45, 47, 52, 53, 56, 76, 77, 103, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-1.2 (2-4)	26 9 12 15	9+ 9+ 9 9+	S2 S1 S3 S3	4-5	2	S	1,2,3,4, 5,6,7,8, 9,10,11, 12,14,17, 20,21,23, 24,27,28

Hymenolobium excelsum (H) **Family:- *Papilionaceae***

(ANGELIM)

Description: Sapwood is 25 to 100mm (1-4 inches) wide and greyish-vhite in colour. Heartwood pale brown with a conspicuous, striped, partidge wood type figure. Grain may be straight or interlocked. Texture uneven and rather coarse. Lustre medium to high. Bole is cylindrical and may be up to 24m (80 feet) long. Buttresses up to 1.8m (6 feet) high. Species occurs in upland rain forests.

Characteristics: Timber air-dries reasonably fast with moderate warping and slight checking. A slower rate of drying may prevent degrade. It presents no problems in machining. Works easily and has no appreciable dulling effect on cutting edges. Turns well. Finishes smoothly and glues readily. Reported to be moderately resistant to marine borers. Sapwood moderately resistant to preservative treatment, heartwood extremely resistant. Weathering properties quite good. Steam bending quality rated poor to fair. Sawdust may cause dermatitis.

References: 1, 49, 75, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
45 (150)	0.9 (3)	1 12	8+ 8	S3 (S4)	4	2	S	1,2,3,4, 5,7,8,9, 12,17,20, 21,23,28

Inga alba (H)

(Syn: *I. fraxinea*)

Family: *Mimosaceae*

(MANNIBALLI)

Description: Sapwood is indistinct from the pale reddish-brown to reddish-white heartwood that is occasionally streaked with darker colours. Texture coarse, lustrous. Grain straight to wavy. Growth rings generally distinct. Bole up to 15m (50 feet) in length with moderately good to poor form and often fluted. Species occurs in rain, marsh and savanna forests and also in secondary formations.

Characteristics: Timber is moderately heavy, hard and strong. Logs and freshly cut timber are prone to discoloration by sap-stain fungi. Seasons rapidly with moderate warping. Stock must be carefully stacked for seasoning. Works easily and finishes to a smooth surface. Attacked by termites and marine borers. Stable in use. Suitable for fuel and cheap plywood.

References: 15, 38, 49, 50, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.8 (2½)	9,1,12	7+ 7	S4 S5	3-4	4	S	2,4,8,12, 15,17,20

Iryanthera lancifolia **(H)** **Family:- Myristicaceae**

(KIRIKAWA)

Description: Sapwood varies in width from 20 to 125mm (3/4-5 inches), and is pale brown in colour. Heartwood is light pinkish-cinnamon to dull oatmeal. Growth rings distinct. Grain straight to slightly interlocked. Texture medium to fine. Lustre medium. Back-cut surfaces shows faint parabolic figures reflecting the growth ring structure. Certain specimens have a waxy appearance. Boles are moderately well-formed, unbuttressed and may be upto 18m (60 feet) long. Species is found in upland virgin forests, usually near small streams.

Characteristics: Timber is of medium hardness and density. Seasons rapidly with moderate checking and slight warping and casehardening. A moderate drying rate may prevent some degrade. Saws well and easily, and works readily with hand and machine tools. Planes and bores to a smooth surface. Polishes well. Reported to be susceptible to insect attack. A substitute for EUROPEAN BIRCH (*Betula verrucosa*).

References: 1, 49, 79, 81, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27 (90)	0.6 (2)	11	8	(S4)	5	4	S	2,8,9,12, 15,20,25, 28,30

Jacaranda copaia *(H)* **Family:-** ***Bignoniaceae***

(GOBAJA, CHINGALA)

Description: Sapwood is not differentiated from the heartwood which is uniform yellowish-white with prominent brownish vessel lines. Lustre medium to high. Grain straight, sometimes slightly interlocked. Texture medium to coarse. Odour and taste not distinct. Boles are 15 to 18m (50-60 feet) long, unbuttressed, cylindrical, and often very slender. Species occurs in mixed hardwood forests, especially in coastal regions on low ridges and flats. Natural regeneration abundant in old clearings.

Characteristics: Timber seasons rapidly with only slight degrade, but mould is apt to develop during conversion, causing discolouration. Works easily with all tools. In planing, tends to be fuzzy unless knife edges are very sharp. Needs sanding to finish well. Holds nails well. Peels and slices satisfactorily. Suitable for plywood. Perishable in contact with the ground. Stock is quickly damaged by insects, but can be easily treated with preservatives.

References: 1, 27, 33, 44, 47, 49, 50, 81, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5-0.6 (1½-2)	8 9 12	6 5+ 5+	S6 S7 S7 (Below)	3-4	4	S	8,12,13, 15,18,19, 20,22,29, 30,31

Jacaranda mimosifolia (H) **Family:- *Bigioniaceae***

(Syn: *J. ovalifolia*)

(JACARANDA MIMOSO)

Description: Sapwood not distinct from the yellowish-white to light brown heartwood often with a pale rose tinge. Faintly lustrous. Texture medium and uneven. Grain straight. Some specimens present an attractive figure on the back-sawn face, due to the vessel and soft tissue arrangement. No odour and taste. Species is widely cultivated in dry and subtropical climates, mainly as a street and ornamental tree. A moderately fast-growing species.

Characteristics: Timber must be seasoned slowly and if possible under cover to avoid distortion. Works easily with most tools, but may be woolly when sawn in green condition. Finishes smoothly and slices well. Takes a good polish and paints satisfactorily. Liable to split when nailed or screwed - pre-boring necessary. Good jointing timber. Susceptible to termite and marine borer attack. Should be suitable for particle-board manufacturing. Dust may cause asthma and dermatitis.

References: 6, 18, 19, 36.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
10-18 (33-60)	0.7 (2¼)	2 1 20 (Exotic)	7+ 7 6 (Imma-ture)	S6 S6 S7 (Below)	3	4	S	6,8,12, 13,15,18, 22,27,28

Laurelia sempervirens **(H)** **Family:** ***Monimiaceae***

(Syn: ***L. aromatica*****)**

(CHILEAN LAUREL)

Description: Sapwood is uniform greyish-brown in colour, not well defined from the heartwood which is yellowish-brown with greenish, grey and purplish streaks. Slightly lustrous. Grain generally straight. Texture moderately fine and even. No odour or taste. Growth rings not well defined. Bole straight. Species occurs in mixed evergreen forests, sometimes in almost pure stands.

Characteristics: Timber air-seasons fairly rapidly with little or no degrade. Kiln-dries fairly readily, but with some-tendency to collapse. Warping or checking may also develop. Works very easily with hand or machine tools. Slight blunting effect on cutting edges. A good, clean finish is obtained in most operations if thin, sharp cutting edges are used. Takes nails and screws satisfactorily, holding power good. Glues well. Stains and polishes satisfactorily. Moisture movement large. Moderately good steam bending properties. Liable to insect attack. Sapwood permeable, heartwood moderately resistant to preservative treatment. Low to medium resistance to wear.

References: 1, 8, 10, 13, 23, 27, 43, 47, 53, 61, 64, 94.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15 (50)	0.6 (2)	10	7	S5	3-4	4	S	2,3,8,12, 15,20,30, 31

Libocedrus chilensis (S) **Family:-** ***Cupressaceae***

(CHILEAN CEDAR, CIPRES)

Description: Sapwood is narrow, yellowish-white in colour. Heartwood pale reddish-brown. Texture fine and even, grain straight. Growth rings distinct producing a mild figure on back-sawn surfaces. Bole straight, slightly conical and up to 10m (33 feet) in length. Species occurs on dry, rocky hillsides and mountains, up to about 1200m (4000 feet) altitude. Does best on wet, deep soils. Trees often grow gregariously, forming small, almost pure stands. Natural regeneration good. Generally a moderately slow-growing species.

Characteristics: Timber works easily with hand or machine tools, with very little dulling effect on cutting edges. Cuts cleanly in most operations provided that sharp cutters are used. Difficult to bore a clean hole unless exit supported. Stock must be pre-bored for nailing and screwing. Stains and polishes satisfactorily. Permeable to moderately resistant to preservative treatment. Makes good firewood. Most commonly used in the round. Suitable for moulding and peeling.

References: 1, 4, 6, 36, 88, 106, 118.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25 (82)	0.3-0.4 (1-1¼)	2 10	6+ 6	S6 S6	3	(3)	N	2,4,6,8, 12,15,17, 20,23,31

Licania macrophylla (H)

Family: *Chrysobalanaceae*
(Formerly *Rosaceae*)

(ANAURA)

Description: Sapwood is 12 to 40mm (½-1½ inches) wide, tan coloured and often rather indistinct. Freshly cut heartwood is reddish-brown, sometimes with light and dark streaks around the pith, but turns to a dark brown shade with a reddish tinge on drying. Grain straight. Texture medium to fine. Lustre low to moderate. Wood contains up to 1.8% silica. Growth rings not evident. Bole moderately well formed. Species is found in marshy woodlands, and in upland forests.

Characteristics: Timber is easy to moderately difficult to air-season. Dries at a medium to fast rate with slight warping, checking and case-hardening. Machining characteristics are poor owing to its density and extremely high silica content. Difficult to saw and plane, and dulls cutting edges quickly. Smooth surfaces are obtainable if tools are kept sharp. Splits easily and does not hold nails well. Highly resistant to marine borer attack. Used for firewood and charcoal. Suitable for marine construction, preferably permanently submerged.

References: 38, 44, 50, 75.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20-24 (65-80)	0.5-0.9 (1½-3)	1,12	9+	S2	5	2-3	(S)	1,2,3,4, 5,6,7,17, 20,21,23

Licaria canella - *(H)* **Family:-** ***Lauraceae***

(BROWN SILVERBALLI)

Description: Sapwood is 20 to 50mm (¾-2 inches) wide, light yellow-brown and poorly defined. Heartwood yellow-brown when freshly cut, turning to dark brown with red or violet tinge on exposure. Lustrous. Texture fine to moderately coarse. Grain normally straight, occasionally slightly interlocked. A fragrant odour in green wood is mostly lost on drying. Taste slightly astringent. Bole 15 to 21m (50-70 feet) in length, cylindrical and unbuttressed but swollen at base. Species is found in rain and dry evergreen forests.

Characteristics: Timber is moderately hard, heavy and tough. Air-seasons well with little degrade, but a tendency to case-harden noticeable. Saws and works easily with all tools. Interlocked material difficult to plane but finishes smoothly. Turns well and takes a high polish. Boring requires special care. Highly resistant to termites, but susceptible to marine borer attack. An excellent bending wood. Suitable for boat-building.

References: 44, 49, 50, 51, 66, 72.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	0.6 (2)	11	8+	(S4)	4-5	2	(S)	1,2,3,4, 6,7,8,9, 11,14,17, 20,28

Licaria cayennensis (H) **Family:** ***Lauraceae***

(KANEELHART)

Description: Sapwood is 12 to 50mm (½-2 inches) thick and light yellowish-brown in colour. Heartwood orange-yellow when freshly cut, darkening to yellowish-brown to dark brown on exposure. Green material has a characteristic fragrant odour, most of which disappears after seasoning. Grain straight or slightly interlocked. Texture fine. Growth rings, when discernible, are poorly defined. Pores contain abundant tyloses. Species is found in mixed rain forests.

Characteristics: Timber moderately difficult to air-season. Dries rapidly, but with slight warping, severe surface checking and moderate casehardening. Should be dried slowly and carefully. Stock rather difficult to work, but smooth surfaces can be obtained in planing, boring and sawing. Boring must be done with some care to overcome a tendency to splinter. No appreciable dulling effect on tools. Turns well. Takes a high polish. Glues satisfactorily. Highly resistant to termite and moderately resistant to marine borer attack. Heartwood impermeable to preservative. Good wearing and weathering properties. Moisture movement moderate. High shock resistance.

References: 44, 50, 75.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5-0.6 (1½-2)	11,12	10+	S1	4-5	1	(N)	1,2,3,4, 5,6,7,8,9, 11,14,20,21, 23,28

Lonchocarpus hedyosmus **(H)**

Family: *Fabaceae*
(Formerly *Papilionaceae*)

(SINGJAPLE)

Description: Sapwood is 50mm (2 inches) wide, grey to lemon-yellow in colour and distinct. Heartwood yellowish-brown when freshly cut, darkening to dark brown on exposure, with lighter coloured parenchyma stripes. Lustre medium. Grain usually straight, interlocked. Texture moderately coarse. Bole 18 to 20m (60-65feet) in length, cylindrical with low buttresses. Species is found in rain forests and marshy forests on alluvial flats.

Characteristics: Timber is very tough and resilient. Seasons well when dried slowly. Moisture movement moderate. Stock works with difficulty, but saws rather easily in spite of its hardness and silica content. Difficult to plane when interlocked material is present. Takes nails and screws poorly. Turns, paints and polishes well. Subject to blue stain. Not resistant to termite and teredo attack. Heartwood extremely resistant to preservative treatment.

References: 44, 50.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-30 (90-100)	0.5-0.7 (1½-2¼)	12	9	S3	3-4	3	(S)	1,2,3,4, 5,7,17, 20,23,28

Loxopterygium sagotii (H)

Family:- *Anacardiaceae*

(HUBUBALLI, SLANGENHOUT)

Description: Sapwood is 50 to 75mm (2-3 inches) thick, often not sharply differentiated from the heartwood, and is pale yellow or light grey-brown in colour. Heartwood light brown to reddish-brown, usually attractively figured with numerous darker stripes and streaks. Texture medium and uniform. Grain straight, interlocked or wavy. Lustre medium. Growth rings indistinct. Deposits in cells may cause dark oily markings on tangential surfaces. Bole fairly well formed and 15 to 20m (50-65 feet) long. Low buttresses present. Species occurs as an occasional tree in rain and savanna forests.

Characteristics: Stock is moderately difficult to air-season. Denser material dries slowly and tends to warp and check. Moisture movement rather low. Timber works well, saws and planes easily, finishing smoothly and polishing well. Gluing requires care. The oily cell content may cause some difficulties in varnishing. Turns well. Moderately resistant to termite attack. Rated low in resistance to marine borer attack. Highly resistant to impregnation with preservatives. Weathering characteristics fair. Stable. Dust may be a health hazard in badly ventilated workshops.

References: 44, 50, 51, 66, 76, 77, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.7 (2¼)	11,12 9	8 8	S4 S4	3-4	2-3	S	1,2,3,4, 7,8,9,11, 12,17,20, 28

Macoubea guianensis (H) **Family:- *Apocynaceae***

(ROKOROKO)

Description: Sapwood is 25 to 50mm (1-2 inches) wide and almost white in colour. Heartwood pale yellow or brownish-yellow. Growth rings not distinct. Grain straight, texture medium and moderately lustrous. Timber shows almost no decorative figure. Bole cylindrical and clear up to 21m (70 feet) long, and swollen at base. Species is found in marsh forests, virgin lowland rain-forests and sometimes in swamp forests. Bark contains latex.

Characteristics: Timber is soft and weak. Air-seasons rapidly with slight warping and checking and a tendency to casehardening. A fairly slow rate of drying recommended to avoid degrade. Stock has good working characteristics. Material is easy to saw, plane and bore, and smooth machined surfaces are readily obtained in these operations. Nails and glues satisfactorily. Polishes well but filler may be necessary. Susceptible to blue stain and termite attack.

References: 1, 49, 50, 81, 83

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6 (2)	12	6+	S7	2-4	4	S	12,15,18, 19,20,31

Manilkara bidentata **(H)** **Family:** ***Sapotaceae***

(BALATA, BOLLETRIE)

Description: Sapwood. is 30 to 50mm (1¼-2 inches) wide, whitish or pale brown and distinct, but not sharply demarcated from the heartwood which is light red when freshly cut, turning to dark reddish-brown when dry. Lustre medium. Texture fine and uniform. Grain usually straight, occasionally interlocked. Characteristic odour when green but no odour or taste noticeable when dry. Boles 15 to 18m (50-60 feet) long, straight, cylindrical and unbuttressed, but with swollen base. Species occurs in many forest types. Prefers rain forests and is not exacting as to soil or topography.

Characteristics: Timber is exceptionally hard, heavy, strong and tough. Air-seasons slowly with tendency to check, warp and caseharden. Must be dried slowly and with care to minimize degrade. Moderately hard to machine because of its high density but cuts cleanly without appreciable dulling of cutting edges. Turning must be done slowly to avoid tearing. Moderately difficult to work but can be finished smoothly. Takes a high polish. Pre-boring necessary for nails and screws. Requires care in gluing. Rated as excellent in steam bending properties. Moisture movement moderate. Sapwood of green logs susceptible to pinhole borer attack. Very resistant to fungal and termite attack but liable to attack by marine borers. Extremely resistant to moisture absorption. High resistance to wear. Does not weather well. Suitable for textile and pulp mill equipment, e.g. shuttles, loom harnesses, bed plates and beaterliners.

References: 1, 27, 38, 44, 45.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-45 (100-150)	0.6-1.2 (2-4)	11,12 23,9	10	S1	5	1	S	1,2,3,4, 5,6,7,8, 9,10,11, 14,17,21, 23,27,28

Marmaroxylon racemosum **(H)** **Family:- *Mimosaceae***

(Syn: *Pithecellobium racemosum*)

(MARBLEWOOD, ANGELIN RAJADO)

Description: Sapwood is yellowish, not sharply differentiated from the heartwood which is brown-yellow with irregular dark brown to purplish-brown streaks and fine parenchyma striping of lighter colour. Lustre low to medium. Texture medium to coarse and feels rather harsh. Grain straight or irregular. No odour and taste. Trunk unbuttressed but with swollen base. Bole fairly straight, 15 to 18m (50-60 feet) long.

Characteristics: Timber is hard, heavy, tough, and strong. Difficult to work with both hand and machine tools because of its high density. Finishes smoothly and takes an excellent polish. Fairly resistant to termites but shows only low resistance to marine borers. Probably extremely impermeable to impregnation with preservatives.

References: 1, 10, 20, 38, 44, 49.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-30 (90-100)	0.4-0.6 (1¼-2)	13	9+	S3	(4)	2	(S)	1,2,3,4, 5,7,8,9, 10,11,12, 20,21,23, 27,28

Melia azedarach **(H)** **Family:-** ***Meliaceae***

(PERSIAN LILAC, PARAISO) (EXOTIC)

Description: Sapwood is yellowish-white, not always demarcated from the pink, pale brown or reddish-brown heartwood. Lustrous. Growth rings distinct. Grain straight. Texture medium to coarse. Species is a native of southern Asia where it occurs at altitudes of up to 1800m (6000 feet). Good results have been reported from Argentina, Uruguay and Brazil. Species has been extensively cultivated as ornamental and shade tree, but sometimes in small plantations. Prefers rich and well-drained soils, tolerates frost, and is drought-resistant. Trees easily broken by wind, especially when fast-grown. Boles short.

Characteristics: Timber is moderately soft, weak and brittle. Reported to season well. Works easily with all hand and machine tools. Planes to a smooth surface. Polishes well, but a filler should be applied. Takes nails and screws easily, but splitting may occur. Glues satisfactorily. Good peeler and slicer. Reported to be very susceptible to termite attack. Sapwood permeable, heartwood moderately resistant to impregnation with preservatives. Makes excellent firewood. Fruits may cause poisoning. Timber has insecticidal properties. Dust may cause dermatitis.

References: 19, 22, 36, 83, 87, 100, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15 (50)	0.3-0.6 (1-2)	1	7+	S5	3-5	3-4	S	2,6,7,8, 9,10,12, 15,17,20, 27,28

Mezilaurus itauba **(H)** **Family: *Lauraceae***

(Syn: *Silvia itauba*)

(ITAUBA)

Description: Sapwood is about 25mm (1 inch) wide, greyish-brown in colour and not clearly defined from the dark olive-brown heartwood. Lustre low. Grain straight or interlocked. Texture fine. Wood appears to be oily but has no distinct odour and taste when dry. Pores contain abundant tyloses. Species occurs in upland forests.

Characteristics: Timber is rated as being difficult to air-season. Considerable difference in tangential and radial shrinkage. Warping and checking occurs in seasoning, so mild conditions should be used to keep degrade at a minimum. Stock difficult to machine but has no appreciable dulling effect on cutting edges. In planing, surfaces may be affected when interlocked material is present but generally finishes smoothly. Holds shape well when manufactured. Reported to be highly resistant to marine borer attack and fairly resistant to termites. Heartwood extremely resistant to preservative treatment. A substitute for TEAK (Tectona grandis).

References: 15, 66, 75, 82, 83, 86.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.8 (2½)	1 6	9+ 8+	S3 S4	2-4	1	(N)	1,2,3,4, 6,8,20, 21,23

Minquartia guianensis **(H)** **Family: *Olacaceae***

(ARATTA, MANWOOD)

Description: Sapwood is 20 to 40mm (¾-1½ inches) wide and tan to mustard-yellow in colour. Heartwood uniform pale to dark olive-brown, possibly streaked with black. Lustre low. Texture very fine. Grain straight to interlocked. Growth rings poorly defined. Bole up to 18m (60 feet) in length, fluted and twisted especially at the base. Buttresses may be absent or slightly developed. Species is found in lowland forests on well drained soils.

Characteristics: Timber seasons at moderate rate with slight checking, warping and casehardening. A slow rate of drying is recommended to avoid degrade. Presents some difficulty in machining operations due to its density, but has no pronounced dulling effect on cutting edges. In planing, surfaces may be affected when material is interlocked. Stock finishes and polishes smoothly. Highly resistant to termite but liable to marine borer attack. Difficult to split.

References: 1, 27, 41, 49, 50, 75, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.9 (3)	27 1 7	9+ 9+ 9	S2 S2 (S3)	5	1	(S)	1,2,3,4, 5,6,9,20, 21,23,28

Mora excelsa **(H)** **Family:- *Papilionaceae***

(Syn: *Dimorphandra excelsa*)

(MORA)

Description: Sapwood is 50 to 150mm (2-6 inches) wide, light yellowish-grey and distinct from the dark brown, reddish-brown, or dark red heartwood, which is marked with white or brown streaks. Lustre high. Texture medium to coarse. Grain straight to interlocked, very variable, often shows birds eye, wavy, orribbon figures. Slightly sour odour and characteristic bitter taste. Growth rings rarely distinct. Wood contains an oil and a glutinous substance. Boles usually straight and clear above buttresses for 15 to 18m (50-60 feet) in length. Buttresses up to 4.5m (15 feet) high. Species found in swamp forests and along rivers. Also common in rain forests, frequently in pure or almost pure stands. Normally a gregarious species. Prefers wet soils. Large trees are often hollow.

Characteristics: Timber is very hard, heavy, tough and strong. Difficult to season. Dries very slowly with appreciable degrade. Fairly difficult to saw and work, but machines well. Moderate to severe blunting effect on cutting edges. In sawing, resin may build up on teeth causing them to vibrate. In planing, a cutting angle of 20° is necessary to overcome tearing on quarter-sawn material. Turns easily. Finishes smoothly and requires little sanding. Polishes well. Does not take nails and screws well without pre-boring, but holds nails and railspikes very well. Splits with great difficulty. Capable of withstanding prolonged wear and tear. Sapwood readily attacked by pinhole borer. Resistant to termites and other insects but susceptible to damage by marine borers. Heartwood extremely resistant to impregnation, sapwood permeable. Bending properties moderately good. Unstable. Highly resistant to fire. Excellent for charcoal.

References: 1, 3, 8, 13, 17, 20, 23, 27, 36, 37, 38, 39, 40, 43, 44, 47, 51, 52, 53, 61, 62, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-36 (100-120)	0.6-0.9 (2-3)	12 25 11	9+ 9+ 10	S2 S1 S1	5	2	S	1,2,3,4, 5,6,7,8, 9,13,20, 21,23,28

Mora gonggrijpii **(H)** **Family:-** ***Papilionaceae***

(Syn: ***Dimorphandra gonggrijpii*****)**

(MORABUKEA)

Description: Sapwood is pale, pinkish-brown, up to 150mm (6 inches) wide and distinct from the heartwood which is pinkish-brown, or reddish-brown to dark brown with paler streaks. Lustre medium to high. Texture rather fine to moderately coarse. Grain straight, often interlocked, sometimes wavy or irregular. Slightly sour odour and bitter taste. Boles cylindrical and 18 to 24m (60-80 feet) in length. Buttresses 1.8 to 3m (6-10 feet) high. Species occurs in rain forests and hillsides on heavy clay soils.

Characteristics: Wood is almost identical to MORA (*Mora excelsa*) in appearance, structure, weight and strength properties. Difficult to season, dries slowly with tendency to warp and check. Should be dried carefully. Difficult to work but machines well. Saws with difficulty, tending to spring. Raised and chipped grain apt to occur with interlocked stock. Turns well and finishes smoothly. Difficult to nail and screw, but holds nails and tie spikes extremely well. Sapwood susceptible to pinhole borer attack. Heartwood highly resistant to termites, but not resistant to marine borers. Heartwood untreatable and sapwood moderately resistant to impregnation with preservatives. Wearing properties good. Resists fires. Reported as being superior to *Mora excelsa*.

References: 1, 8, 13, 27, 31, 38, 43, 44, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-36	0.4-0.6	9	10	S1	5	2	S	1,2,3,4,
(100-120)	(1¼-2)	11	10+	S1				5,6,7,8, 9,13,20, 21,23,28

Myrocarpus fastigiatus (H) Family:- *Papilionaceae*

(CABREUVA, INCIENSO)

Description: Sapwood is whitish or yellowish in colour. Heartwood yellowish-brown to reddish-brown, often with darker streaks and mildly golden lustre. Rather waxy appearance. Spicy odour. Texture fine and even. Grain irregular, producing a narrow ribbon figure. Bole clear of branches up to 15m (50 feet) or more in length. Species occurs in mixed hardwood forests.

Characteristics: Timber is hard, heavy, tough and very strong. Moderately difficult to season because of its tendency to warp and check during drying. Green material contains only relatively small amounts of moisture. Stock rather hard to carve and work with tools, but finishes smoothly with sharp cutting edges. Turns well. Polishes nicely. Weathering properties good. Very resistant to insect attack. Excellent dimensional stability. Used for lining clothes chests. Bark yields a resin which is used medicinally.

References: 1, 9, 16, 35, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
38 (125)	0.6 (2)	1	9+	S2	4-5	1	(N)	1,3,4,5, 6,7,8,9, 11,12,17, 20,24,28

Myroxylon balsamum **(H)** **Family:-** ***Papilionaceae***

(BALSAMO)

Description: Sapwood is white and clearly demarcated from the heartwood, which is dark or purplish-red to reddish-brown, with stripes of lighter colour. Grain typically interlocked. Texture moderately fine. Lustrous. Taste sometimes slightly bitter, scent spicy. Boles 10 to 15m (33-50 feet) long, straight, cylindrical and unbuttressed. Species found commonly in rain forests. Grows fast and is a source of natural resin called "Balsam". Cultivated in various parts of the tropics.

Characteristics: Timber is heavy, hard, tough and strong. Moderately difficult to work, but finishes very smoothly with a high natural polish. Care may be needed in planing quartered stock because of interlocked grain. Does not stain well. Resistant to fungi and insect attack. "Balsam" is used medicinally and in perfumery.

References: 1, 3, 7, 20, 27, 32, 53.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-20 (50-65)	0.5-0.8 (1½-2½)	9 1 2	9 9+ 9	S3 S2 S3	3	1-2	(S)	1,2,3,4, 5,6,7,8, 9,10,11,12,17,20,21,23,24,28

Nothofagus alpina **(H)** **Family:** ***Fagaceae***

(Syn: ***N. procera*****)**

(RAULI)

Description: Sapwood not well differentiated from the uniform reddish-brown heartwood. Texture very fine and uniform. Grain straight. Lustre low. Odour and taste absent. Growth rings distinct. Bole straight with clear length up to 18m (60 feet). Found at altitudes of from about 90 to 600m (300-2000 feet). Occurs in pure stands on rich soils. Trees grow fast and regenerate freely and easily.

Characteristics: Timber seasons well but rather slowly with little degrade. Works easily with hand and machine tools, but with slight blunting effect on cutting edges. Finishes very smoothly. Stains and polishes well. Glues satisfactorily. Thin material should be pre-bored for nailing and screwing. Moderately good for steam bending. Liable to termite and marine borer attack. Heartwood and sapwood moderately resistant to preservative treatment. Moisture movement small. Stable in use. Wearing properties medium to high.

References: 1, 3, 5, 8, 10, 23, 27, 36, 43, 47, 61, 64, 92, 94.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	0.8 (2½)	10 28 (Exotic)	6+ 6+	S7 S7	3-4	2-3	S	2,4,6,8 12,14,15, 16,17,20, 25,28

Nothofagus dombeyi **(H)** **Family:** ***Fagaceae***

(COIGUE)

Description: Sapwood is wide, not clearly demarcated from the heartwood, and greyish-white in colour. Heartwood pale pinkish-white when freshly cut, turning to pale pinkish-brown to yellowish-brown on exposure. Lustre high. Texture fine and uniform. Grain straight. Growth rings fairly well defined. Pith flecks often present. Bark contains tannin. Bole up to 25m (82 feet) or more in length. Species occurs from coastal areas up into high mountains, mainly at altitudes between 700 to 1200m (2300-4000 feet), in dense forests and almost pure stands. Often in small groups. Good natural regeneration. A fairly fast-growing species.

Characteristics: Timber is variable in its seasoning proper-ties, but generally dries very slowly with a pronounced tendency to distort and split. Must be seasoned under cover. Works readily by hand and machine tools, with moderate blunting effect on cutting edges. A good finish can be obtained by keeping cutting edges sharp. Severe staining may occur when in contact with metal. Takes stain and polish satisfactorily. Susceptible to pinhole borer and termite attack. Sapwood permeable, heartwood moderately resistant to preservative treatment. Good steam bending qualities. Makes good firewood.

References: 1, 4, 6, 8, 27, 36, 43, 53, 94

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
45 (150)	1.5-2.4 (5-8)	10 2	7+ 7+	S5 S6	4-5	3	S	2,4,5,6, 8,9,10, 13,15,17, 20,21,23, 24,30,31

Nothofagus obliqua **(H)** **Family: *Fagaceae***

(ROBLE)

Description: Sapwood is yellowish-pink. Heartwood pink to deep reddish-brown with mild streaks. Lustre low, more pronounced on the longitudinal surface. Texture fine and even. Grain straight. No distinct odour and taste. Wood contains abundant tannin and resin containing cells. Bole 25 to 30m (82-100 feet) in length. Species found in the drier regions, away from the coastal evergreen rain forests, on good soils. Occurs both in dense pure stands and in mixture with other species. Natural regeneration variable.

Characteristics: Timber is fairly dense and moderately strong. Difficult to season. Dries slowly with a marked tendency to warp and split. Must be dried carefully. Stock works easily and finishes smoothly. Takes paints very well and varnishes satisfactorily. Makes good firewood and charcoal. Immature material non-durable.

References: 1, 4, 6, 27, 36, 53, 94.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
48 (160)	1.2-1.5 (4-5)	10 2	7+ 8	S5	4-5	(2)	(S)	1,2,3,4, 6,7,8,9, 17,20,21, 23,28,31

Nothofagus pumilio (H) **Family: *Fagaceae***

(LENGA)

Description: Sapwood is whitish-pink, not clearly demarcated from the heartwood which is yellowish-pink, darkening with age. Little figure on longitudinal surfaces. Slightly lustrous. Texture fine and even, grain straight. Growth rings distinct. Bole straight and cylindrical. Species found on high plateaux at altitudes between 1000 and 2000m (3300-6600 feet), in usually pure stands. Also found in low montane areas in mixed forests. Natural regeneration abundant.

Characteristics: Timber seasons fairly well. Saws well and works easily with most tools. Finishes to a good surface and polishes satisfactorily. Good nail-holding power. Gluing properties satisfactory. Regarded as moderately good for steam bending. Timber often used in the round. A good substitute for EUROPEAN WALNUT (*Juglans regia*), especially for plywood production. Not suitable for firewood.

References: 1, 4, 6, 120, 121, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	1.5 (5)	10 2	7 7	S6 S7	(4-5)	(3)	S	2,4,6,7, 8,9,12, 13,15,17, 20,23,24, 25,27,28

Ochroma pyramidale *(H)* Family:- *Bombacaceae*

(Syn: *O. lagopus*)

(BALSA)

Description: Sapwood, which provides most of the commercial wood, is almost white or oatmeal coloured, often with a yellowish or pinkish hue. Heartwood pale brown or slightly tinged with red. Texture coarse and even. Grain straight. Rather high, silky lustre. No odour and taste. A fast-growing, short-lived species, often attaining very good dimensions in 6 to 7 years. In its natural habitat, it grows on alluvial flats with rainfalls of 1500 2000mm (60-80inches) a year, generally at about 300 to 750m (1000-2500 feet) above sea level. Species generally occurs in natural openings or after the original forest has been destroyed by fire or floods, or in clearings resulting from cultivation. Prefers rich well-drained soils at low altitudes. Tried as a plantation species, but often grows very slowly, producing denser wood which is unacceptable as commercial balsa.

Characteristics: Logs must be converted very soon after felling to prevent severe sap-stain, damage by pinhole borer and extensive splitting. Kiln-drying of converted stock preferable to air-drying to minimise degrade. Even when kiln-dried, it is apt to split, warp and caseharden. Works very easily with sharp, thin-edged power or hand tools and has practically no dulling effect on cutting edges. Dull or thick-edged tools may cause crumbling producing a woolly finish in planing. Stains and polishes fairly well, though it is highly absorbent. A filler is necessary if a good surface coating is required. Takes nails and screws readily, but is too soft to hold them firmly. Glues satisfactorily. Not suitable for steam bending. Very prone to termite and marine borer attack. Heartwood resistant, sapwood permeable to preservative treatment. Species is the lightest commercial wood in use today and also one of the best energy absorbers known. Possesses an unusually high degree of buoyancy, and provides excellent insulation against heat, cold and sound. Suitable for a great number of special uses, mainly where these properties are essential. Moisture movement small. Stable in use. A first class model-making timber.

References: 1, 2, 3, 5, 8, 11, 13, 19, 20, 23, 36, 38, 43, 45, 64, 96, 104.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18-27 (60-90)	0.8-1.2 (2½-4)	7 9 30	2 3 1	S7 (Below) S7 (Below) S7 (Below)	2-4	4	S	13,18,27, 29,30,31

Ocotea barcellensis (H) **Family:- *Lauraceae***

(Syn: *Nectandra elaeophora*)

(LOURO INAMUI)

Description: Sapwood is not clearly differentiated from the uniform pale golden-brown heartwood. Grain slightly interlocked, giving a stripe figure on quarter-sawn surfaces. Texture medium. Moderately lustrous. Freshly sawn wood has strong fragrant odour, largely lost after drying. Species found commonly in lowland forests and on areas subject to periodical flooding.

Characteristics: Reported to dry well. Timber works well with all tools and finishes smoothly. In planing quarter-sawn surfaces, a cutting angle of 200 is advisable owing to interlocked grain. Good reputation for stability. Suitable for high class joinery.

References: 8, 15, 47, 57, 70, 82.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18-30 (60-100)	0.6-0.8 (2-2½)	1	8	S3	3-5	(2-3)	(S)	1,2,3,4, 6,8,20

Ocotea canaliculata (H) **Family:-** ***Lauraceae***

(WHITE SILVERBALLI)

Description: Sapwood and heartwood are not differentiated. Wood is pale cream when freshly cut, darkening to cream-yellow on exposure. Texture medium. Grain straight to wavy. Lustrous. Faint aromatic scent, taste not distinct. Bole 12 to 18m (40-60 feet) long, straight and cylindrical. Trunk usually basally swollen, occasionally buttressed up to a height of 1.8m (6 feet). Species frequently found in rain forests, rarely in dry evergreen forests.

Characteristics: Timber air-seasons well with only a little degrade. Stock left lying in the sun splits and warps readily. Saving may occasionally produce a woolly surface. Works easily and planes to a smooth finish. Turns fairly well with sharp tools. Timber stains, paints and glues well. Takes nails well without splitting, except on end grain. Reported to be fairly resistant to termites. Weathering properties good. Stable when jointed. Suitable for plywood and cheap furniture.

References: 49, 51, 66, 73.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-30 (80-100)	0.5-0.6 (1½-2)	11	6+	(S6)	(3)	4	S	6,8,12, 15,17,18, 19,20,28, 30,31

Ocotea porosa (H) **Family:- *Lauraceae***

(IMBUIA)

Description: Sapwood is grey and usually distinct from the heartwood, which is yellowish or olive to deep brown, and may be plain or figured. Lustre medium. Texture fine and even. Grain mostly straight, occasionally wavy. Spicy, resinous odour in fresh timber, which disappears after drying. Growth rings usually visible. Bole lengths of up to 10 or 12m (33-40 feet). Species occurs mostly at altitudes of 750 to 1200m (2500-4000 feet) in dense forests mixed with PARANA PINE (*Araucaria angustifolia*) and various hardwoods. Large overmature trees often affected with heartrot and occasionally hollow.

Characteristics: Timber is fairly hard and heavy. Seasoning does not present many problems, although stock may warp or check. Slow air-drying or mild kiln temperatures are advisable. Species saws and machines satisfactorily, showing moderate blunting effect on cutting edges. Easy to work and finishes smoothly. Cutting angle of 20° may be required to prevent tearing in planing. Turns and carves satisfactorily. Glues and varnishes readily, and takes a high polish. Good nailing characteristics. Only rarely attacked by termites and other insects. Sapwood and heartwood moderately resistant to impregnation with preservatives. Often sliced into decorative veneer. Peels well. Very stable when manufactured. Moderate to high resistance to wear. Often used as substitute for EUROPEAN WALNUT (*Juglans regia*).

References: 1, 3, 5, 7, 8, 9, 18, 23, 31, 35, 47, 61, 71, 119.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	1.8 (6)	1 20 (Exotic)	7+ 7+	S5 S6	2-3	2-3	S	2,3,4,6, 8,10,12, 14,17,18, 20,21,23, 24,27,28

Ocotea rodiaei (H) **Family:- *Lauraceae***

(Syn: *Nectandra rodiaei*)

(GREENHEART)

Description: Sapwood is about 75mm (3 inches) thick, pale yellowish-brown or greenish, merging gradually into the heartwood which varies in colour from greenish-yellow or light olive to dark olive green or very dark brown, often with darker brown or black markings. Grain straight to wavy and uniform. Texture moderately fine to fine, lustrous. Freshly cut timber is aromatic but without odour and taste when dry. Wood contains tyloses, dark gum and certain alkaloids. Free of knots and other defects. Bole straight and cylindrical with moderate taper, 15 to 23m (50-75 feet) long. Usually with low buttresses or swollen base, occasionally buttressed up to 2.4m (8 feet) high. Found frequently in dense forests, on slopes leading down to streams and in damp sites near streams. Also grows in swamp forests.

Characteristics: Timber is very hard, heavy, and strong. Air-seasons very slowly with slight tendency to check and end split but warping is not serious. Kiln-dries very slowly, particularly in thicker sizes, with considerable degrade. Low initial temperatures advisable. Moderately difficult to work with both hand and machine tools and dulls cutting edges quickly. In planing, a cutting angle of 20° is necessary owing to high density and interlocked grain. Finishes well and smoothly. Turns easily. Takes a high polish. Moderately good steam bending properties. Requires preboring for nails and screws. Gluing characteristics variable. Non-corrosive to metals. Used in chemical plants for vats and filter press plates. Very resistant to termite, marine borer and pinhole borer attack. Heartwood extremely resistant to preservative impregnation. Very good. weathering characteristics and excellent wearability. Fire resistant.

References: 1, 2, 3, 5, 8, 10, 14, 17, 20, 23, 31, 34, 38, 47, 49, 51, 52, 53, 58, 92, 104.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5-0.6 (1½-2)	11	9+	S1	4-5	1	(N)	1,2,3,4, 5,6,7,8, 9,10,11, 20,21,23, 25,28

Ocotea rubra (H) **Family:- *Lauraceae***

(DETERMA, LOURO VERMELH0)

Description: Sapwood is about 25 to 50mm (1-2 inches) wide, creamy-grey or pale brown and well demarcated. Heartwood deep salmon red when freshly cut, turning to light reddish-brown or pinkish-red with golden lustre after seasoning. Occasionally with pink or yellow streaks. Texture coarse, uniform. Grain straight to irregular. Quartersawn material sometimes attractively figured. Growth rings not distinct. Green timber has aromatic scent but no odour or taste when dry. Vessels contain deposits of tyloses. Free of knots and other defects. Boles straight and cylindrical, unbuttressed but with swollen base, and clear of branches for 12 to 24m (40-80 feet). Species occurs in lowland, marsh and rain forests.

Characteristics: Air-seasons at a moderate rate with tendency to check and warp. Thick stock dries rather slowly. Kiln-dries satisfactorily with a mild schedule. Timber works easily with either hand or machine tools, with only slight blunting effect on cutting edges. Stains and polishes well, although its coarse texture requires the use of fillers. Glues and nails well. Average steam bending properties. Weathering characteristics very good. Very stable. Pinhole borer damage sometimes present. Conflicting reports on termite resistance. Moderately resistant to marine borer attack. Heartwood extremely resistant to preservative treatment, sapwood moderately resistant.

References: 1, 3, 5, 7, 8, 14, 15, 17, 27, 38, 47, 49, 51, 52, 53, 59, 76, 77, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-30 (90-100)	0.6-0.9 (2-3)	1 11 12,13	7+ 7 8	S4 S4 S5	3-4	2	S	1,2,4,6, 7,8,12, 15,17,20,21,23,24,28,31

Ocotea wachenheimii (H) **Family:- *Lauraceae***

(KERETI SILVERBALLI)

Description: Sapwood greyish, merging gradually into the heartwood which is greenish yellow, light brown or yellowish-brown. Satiny lustre. Texture medium to fine. Grain straight to moderately coarse. Oil cells present. Taste and odour typically fragrant, similar to *Cedrela* spp. Boles cylindrical, clear for 18 to 21m. (60-70 feet) in length. Base often swollen or occasionally with low buttresses. Occurs in rain forests on light or heavy soils. Also found in marshy forests.

Characteristics: Timber air-seasons well under cover with little distortion. Moisture movement rather low. Works well and easily with all tools. Saws well and finishes smoothly. Glues, stains, and paints well. Moderately resistant to termites but presents little resistance to marine borers. Heartwood resistant to impregnation, with preservatives. Suitable for plywood.

References: 38, 39, 44, 49, 50, 51.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-27 (80-90)	0.5-0.6 (1½-2)	12	6+	S7	3-4	3	S	2,4,6,8, 12,15,17, 18,20,28, 31

Oxandra lanceolata (H) **Family:-** ***Anonaceae***

(Syn: ***C. laurifolia*****)**

(LANCEWOOD)

Description: Sapwood is pale yellowish. Heartwood, almost black in colour, develops late in older specimens. As generally the sapwood only is utilized, young trees are preferred for conversion. Lustre medium to high. Grain straight, texture fine and even. No distinct odour or taste. Growth rings indistinct. Generally a small tree with slender bole up to 4m (14 feet) in length. Species widely distributed in forest areas of tropical America.

Characteristics: Timber is strong, hard, heavy, and resilient. Fairly difficult to work with hand or machine tools, but has only a small blunting effect on cutting edges. In planing, extra pressure and sharp tools are required to prevent riding on cutters. Generally planes smoothly, but the cutting angle should be not more than 25°. Turns and carves well. Takes stain and polish excellently. Stock splits easily and should be pre-bored for nailing and screwing. Used for special items such as bobbins, fishing rods, certain parts in organ-building, and particularly for archery bows.

References: 1, 8, 10, 17, 27, 34, 35, 43, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
9 (30)	0.3 (1)	13,41	9+	(S2)	(5)	4	(S)	9,10,16, 28

Paratecoma peroba (H) Family:- *Bignoniaceae*

(PEROBA DO CAMPO)

Description: Sapwood is white or pale yellowish-grey, clearly defined from the heartwood which is light olive-brown with a yellowish, greenish or reddish hue, sometimes distinctly striped. Fairly lustrous. Grain straight, wavy or occasionally, interlocked giving rise to a stripe or roe figure. Texture medium and even. Ripple marks occur but are not constant or uniform in distribution. Odour and taste absent. Growth rings usually visible. Bole usually well formed and cylindrical up to 30m (100 feet) in length. Species grows mainly in coastal type forests.

Characteristics: Timber dries readily and well with little checking. Distortion not generally serious though fairly severe twisting may occur if irregular grain present. Works very well in all processes, but care is required to prevent raised grain with interlocked material. Silica and extractives may have a dulling effect on cutting edges. Material finishes smoothly and stains fairly well. Polishes satisfactorily. Good gluing properties. Peels well. Damage by pinhole borer occasionally present. Heartwood resistant to preservative treatment. Poor steam bending properties. Good acid-resisting qualities and weathering properties. Sawdust has irritant effect, and may cause dermatitis.

References: 1, 2, 3, 5, 8, 23, 27, 29, 64, 92, 96.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (100)	1.5 (5)	1	8+	S4	3-4	1	S	1,2,3,4, 5,6,7,12, 17,20,23, 25,31

Parinari campestris **(H)** **Family:** ***Rosaceae***

(FOENGOE, BURADA)

Description: Sapwood is about 40mm (1½ inches) wide, not clearly defined and somewhat paler than the light brown heartwood. Lustre medium. Grain usually straight, sometimes slightly interlocked. Texture fine. Wood containsa high amount of silica. Bole 12 to 15m (40-50 feet) long, cylindrical. Buttresses low and thick. Species is found in rain, marsh and savanna forests.

Characteristics: Timber is easy to air-season, drying rapidly with slight checking and warping. Some slight casehardening may occur. Mild drying schedules recommended for minimal seasoning defects. Stock difficult to machine because of its high density and high silica content, dulling cutting edges rapidly. Smooth surfaces can be obtained in planing, boring and sawing operations if tools are properly maintained. Takes only a fair polish. Nails poorly - pre-boring necessary to prevent splitting. Turns badly. Resistant to marine borers and insect attack. Permeable to impregnation. Useful for marine constructions.

References: 44, 49, 50, 75, 80, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23 (75)	0.7 (2¼)	12	9	S2	5	(3)	(N)	1,2,3,4, 21,23

Patagonula americana **(H)** **Family:- *Boraginaceae***

(GUAYABI)

Description: Sapwood is wide, white to brownish in colour. Heartwood uniform olive or variegated in various shades of brown and purple. Lustre medium. Grain fairly straight. Texture rather fine, uniform. Bole straight and up to 20m (65 feet) in length. Species occurs in wet soils of lowland forests and at the foot of hills. Natural regeneration excellent. A moderately fast-growing species.

Characteristics: Timber is hard, heavy, tough, strong and resilient. Works fairly easily with all tools. Saws, carves and slices satisfactorily. Finishes smoothly and takes a high lustrous polish. Good wearing characteristics. Steam bending qualities excellent. Makes very good fuel. A substitute for EUROPEAN ASH (*Fraxinus excelsior*).

References: 1, 4, 6, 20, 22, 27, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25 (82)	0.8 (2½)	2 1	8 8+	S4 S3	5	2	(S)	1,3,4,5, 6,7,8,9, 10,11,12 14,16,17 20,23,24 27,28

Peltogyne pubescens (H) **Family:- Papilionaceae**

(PURPLEHEART)

Description: Sapwood is 50 to 100mm (2-4 inches) wide, whitish with thin purple streaks, and clearly defined. Heartwood dull brown when freshly cut, turning to a dark brown on exposure. Lustre medium. Lumina contain a red gummy substance. Grain usually straight, sometimes wavy or interlocked. Texture fine to medium and even. Growth rings indistinct to distinct, depending on presence of terminal parenchyma. No odour and taste. Boles clear for 18 to 21m (60-70 feet) in length, straight, cylindrical, and with considerable taper. Buttresses 0.6 to 0.9m (2-3 feet) high. Species occurs in dry evergreen and swamp forests, rain and savanna formations.

Characteristics: Timber is very hard, heavy, tough and strong. Seasoning usually moderately difficult. Air-dries well but slowly with slight to moderate degrade. Kiln-dries readily and well with little degrade. Mild initial temperatures advisable. Moderately difficult to work with either hand or machine tools, causing dulling effect on cutting edges. Straight-grained material saws and planes well if sharp tools are used. Finishes smoothly and stains well. A 15° cutting angle is required for material with interlocked grain. Glues well. Difficult to nail - pre-boring necessary. Timber very resistant to termite but prone to marine borer attack. Heartwood extremely resistant to preservative treatment, sapwood permeable. Moderately good steam bending characteristics. Wearing properties excellent. Acid and fire resistant.

References: 1, 3, 5, 8, 14, 20, 23, 31, 34, 38, 44, 49, 50, 51, 53, 92.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-36 (90-120)	0.5-0.9 (1½-3)	11 1 12	10 9 8+	S1 S2 S2	2-3	1	S	1,2,3,4, 5,6,7,8, 9,10,14, 17,20,21 23,25,28 30

Persea lingue **(H)** **Family:** ***Lauraceae***

(LINGUE)

Description: Sapwood and heartwood not well defined, light pink merging into light pinkish-brown to pale brown in colour, sometimes with a faint figure. Grain sometimes straight, frequently interlocked. Texture medium to coarse and even. No odour and taste. Bole straight. Species sometimes forms almost pure stands.

Characteristics: Timber has a slight tendency to warp in seasoning. Works fairly easily by hand or machine tools and has little dulling effect on cutting edges. Saws satisfactorily. In planing, a cutting angle of 20° and sharp cutting edges are necessary to ensure a good finish. Stains and polishes satisfactorily. Reported to be suitable for steam bending. Resistance to shock very low. Bark is source of tannin.

References: 1, 8, 35, 43, 94.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18 (60)	1 (3¼)	10	7+	S6	4-5	3	S	2,4,8,12, 17,20

Phyllostylon brasiliensis **(H)** **Family:** ***Ulmaceae***

(Syn: ***P. rhamnnoides*****)**

(SAN DOMINGO BOXWOOD)

Description: Sapwood is narrow, white to pale yellow and not well defined from the heartwood which is lemon, sometimes tinged with brown and occasionally with dark streaks. Texture very fine and uniform. Grain fairly straight, sometimes diagonal. Odour and taste not distinct. Wood contains chalky white deposits. Boles may be up to 9m (30 feet) in length, frequently fluted. Species is widely distributed through the sub-tropical and tropical forests.

Characteristics: Timber is heavy and hard. Some care needed in seasoning as otherwise staining may occur, but distortion not serious. Slow air-drying schedules recommended. Working qualities generally good. Turns and carves readily. Can be stained satisfactorily and takes a high polish. Glues well. Holds nails and screws well but pre-boring advisable with thin stock. Highly resistant to insect attack. Not usually given a preservative treatment. Stable when dry. Good substitute for MARACAIBO BOXWOOD (*Gossypiospermum praecox*).

References: 1, 3, 8, 13, 20, 23, 35.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-21 (50-70)	0.6 (2)	2	9	(S3)	3-5	2	S	5,7,8,9, 10,12,14, 16,11,20, 24,27,28

Pinus caribaea ***(S)*** **Family:** ***Pinaceae***
(Syn: ***P. bahamensis*****)**

(CARIBBEAN PINE) (EXOTIC)

Description: Sapwood is white-yellow and heartwood reddish-brown with fairly wide summerwood rings. Growth rings clearly distinct, defined by bands of dense tissue. Resin canals numerous, prominent as straight brown stripes on longitudinal surfaces. Texture coarse. Grain typically straight. Lustre medium. On account of its light branching habit, the yield of first-grade structural timber is exceptionally high. Freshly felled logs exude copious amounts of resin on end grain. Young trees often grow very rapidly. Likely to produce the best results on sites similar to its natural range in Central America. Appears to be well adapted to hot, dry, infertile areas. All properties vary with site of origin. Mean height of approximately 19m (62 feet) and mean diameter of 210mm (8½ inches) obtained with 11.5 year-old plantations.

Characteristics: Timber dries relatively slowly with tendency to end-splitting in thick stock. Sapwood of green material readily attacked by blue stain fungi and should preferably be treated with anti-stain solutions before seasoning. Seasoned boards should be stored under cover. Knots main cause of degrade if appropriate pruning not undertaken. Compression wood also a defect in young fast-grown material. Timber works easily but excessive resin may cause difficulties in sawing and planing. Finishes cleanly. May sometimes split in nailing or screwing, but generally holds nails and screws well. Resistance to insect attack dependent on resin content, but susceptible to termite and marine borer attack. Heartwood moderately resistant to impregnation with preservatives, sapwood permeable. A moderately good steam bending species. Quite stable. Yields resin and turpentine of good quality. Often confused in the past with SLASH PINE (*Pinus elliottii*).

References: 18, 19, 34, 36, 38, 44, 81, 87, 91, 101, 102.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-30 (50-100)	0.9 (3)	17 (Native) 15 (Native) 1 (Immature)	8+ 9 5+	S4 S3 S7	4	3	N	2,4,6,8, 12,13,15, 17,18,20, 23,25,27

Pinus elliottii ***(S)*** **Family:-** ***Pinaceae***

(SLASH PINE) (EXOTIC)

Description: Sapwood usually about 50mm (2 inches) but up to 150mm (6 inches) wide. Heartwood yellow to red-brown, generally resinous and barely distinguishable from the paler coloured sapwood. Growth rings distinct. Texture medium. Grain straight, but sometimes spiral. Boles usually cylindrical and even. Grows less rapidly and produces a smaller volume of sawn wood than some other pines. Oleo-resin freely exuded from freshly-cut ends. A native of the coastal plains of the south-eastern United States of America where it is known to yield an excellent turpentine. Species has done well in Brazil on poor soils at altitudes between 600 and 1100m (2000-3600 feet). Planted in many countries on account of its freedom from serious diseases and adaptability to a variety of climatic conditions. In Brazil, a 21 year-old plantation has reached an average height of 24m (80 feet) anddiameter of approximately 40Omm (16 inches). Good results also have been obtained in Argentina and Uraguay. Very resistant to fire.

Characteristics: Timber from young trees is light in weight, brittle and soft. Mainly used for pulping but also as framing timber. Older specimens yield material, typically harder and heavier than most other commercial pines, comparable in strength properties with good quality DOUGLAS FIR (*Pseudotsuga menziesii*). Can be seasoned with little degrade, but slight surface checking and splitting down the centre may occur. Juvenile wood apt to twist excessively unless adequately restrained during drying. Mature timber moderately difficult to work with hand and machine tools, but finishes cleanly in most operations. Paints satisfactorily. Resin may be troublesome in adhering to teeth and cutting edges and in gluing. Long pitched saw-teeth reduce sawing problem. Timber holds nails and screws firmly. Susceptible to termite and marine borer attack. Damage by furniture borers sometimes present. Sapwood permeable, heartwood resistant to preservative treatment. Moderately resistant to shock. Suitable for resin tapping.

References: 2, 18, 22, 36, 87, 91, 106, 124, 125, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-30 (80-100)	0.6-0.9 (2-3)	1,20 (Immature) 40 24 (Native)	6+ 7 8	S6 S5 S4	3	3-4	N	1,2,3,4, 5,7,8,12, 13,15,17, 18,20,23, 27,28

Pinus kesiya **(S)** **Family:- *Pinaceae***

(Syn: *P. insularis*)

(BENGUET PINE, KHASYA PINE) (EXOTIC)

Description: Sapwood is 40 to 50mm (1½-2 inches) wide and pale creamish-yellow. Heartwood reddish-yellow to reddish-brown in colour, darkening on exposure. Grain straight. Texture rather coarse to medium and uneven. Growth rings visible to the naked eye. Wood very resinous with numerous resin canals, often seen as straight brown scratches on longitudinal surfaces. Species is a native of south-east Asia, attaining its best growth in Burma. Prefers altitudes ranging from 600 to 2400m (2000-8000 feet). Very good growth rates reported for plantations in Brazil, but form of trees not always desirable. Grows well at sea level and tolerates a wide range of well-drained soils and a temperature range of 1° to 38°C. Prone to fire damage in early stages of growth.

Characteristics: Strength properties liable to vary with area and age of growth. Logs should be converted soon after felling and the timber dried in strip-stacks under cover. Kiln-dries well though resin may exude during this process. Saws and works readily, though high resin content may dull tool edges. Finishes smoothly with most tools, but knots may be troublesome. Glues and nails well. Liable to sap-stain and occasional pinhole borer, termite and marine borer attack. Sapwood permeable, heartwood moderately resistant to preservative treatment. Suitable for mechanical and chemical pulping.

References: 11, 18, 19, 36, 87, 106, 124.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30	0.4-1	1 (Immature)	6+	S7 (Below)	2-3	3	N	1,2,4,6,
(100)	(1¼-3¼)	20	6+	S6				8,11,12,
		42 (Native)	8	S4				13,15,17,
								18,20,21, 22,23,28

Pinus patula (S) **Family: *Pinaceae***

(Syn: *P. subpatula*)

(PATULA PINE) (EXOTIC)

Description: Sapwood is not easily distinguishable from the heartwood. Early wood is almost white, while late wood is pale brown. Numerous small resin canals, visible to the naked eye and prominent on tangential surfaces. Grain may be straight, spiral or wavy. A native of Mexico, it grows on a wide range of soils showing best results on loamy soils. Where soil depth is inadequate, trees may suffer from drought. Form of stems generally good. Very fast-growing species with knots rather prevalent. Pruning recommended. Good growth has been obtained in some areas in Brazil. The best areas for plantations are in the Andes, from Ecuador northwards, and on the eastern side of the southern Andes in Argentina, at altitudes between 1000 and 3000m (3300-9900 feet) with a summer rainfall.

Characteristics: Logs and sawn timber susceptible to blue stain. Rapid conversion after felling and anti-stain dipping after conversion necessary to avoid discolouration. 25mm (1 inch) thick boards may be air-dried in about 5 weeks. Kiln-dries rapidly, usually with little distortion. Saws easily but must not be fed too quickly, otherwise rough surfaces obtained. Planes and moulds easily with only slight raising of grain around knots. Turns fairly well but for boring and mortising a support is needed at the exit side to avoid breaking away. Takes nails easily without splitting. Glues well. Susceptible to pinhole borer, longhorn, marine borer, furniture borer and termite attack. Boards containing large knots produce attractive panelling.

References: 18, 36, 87, 106, 109.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.4-0.6 (1¼-2)	1 20 37	7 6+ 7	S5 S6 S5	3-4	4	N	2,4,7,8, 12,13,15, 17,18,20, 22,23,25, 28

Pinus radiata ***(S)***
(Syn: *P. insignis*)

Family:- *Pinaceae*

(RADIATA PINE) (EXOTIC)

Description: Wood is white when first cut, turning to pale pinkish-brown with age. Usually very little difference in colour between sapwood and heartwood. Growth rings distinct. Resin ducts appear on longitudinal surfaces as fine, brown lines. Grain near the pith often spiralled but elsewhere usually straight. Knots common but close planting and pruning reduce their significance. Logs usually straight and of good form. Grows on a wide variety of soils, but does best on fairly fertile, deep and well drained soils. Hardy to frosts. Logs left on the ground after felling subject to sap-stain. Susceptible to hail and subsequent fungal infection. Planted in Ecuador, where a 20 year-old plantation attained an average height of 24m (80 feet) at altitudes between 2500 and 3600m (8200-11800 feet). Excellent results have been obtained in Chile where boles may be 20 to 30m (65-100 feet) in length.

Characteristics: Kiln-dries rapidly. Pith-included timber should be adequately weighted to minimize tendency to twist during drying. Seasons well but knots may cause localized distortion. Saws easily but splitting may occur in thick stock cut near the pith. Grain tends to tear around knots. Good surface obtained when carefully planed with sharp and thin cutting edges. Works easily with hand and machine tools. Paints and varnishes well. Nails rather well except in denser material which may split. Holds screws firmly. Glues satisfactorily. Termite resistance low. Occasional damage by furniture borer, pinhole borers and longhorn beetles possible. Material from young, rapidly grown plantations consists almost entirely of permeable sapwood, easy to treat with preservatives.

References: 11, 18, 19, 36, 53, 87, 91, 105, 106, 107, 108, 110, 111.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-40 (100-130)	0.4-0.9 (1¼-3)	10 20,40	6+ 7	S6 S5	3-4	4	N	1,2,3,4, 8,12,13, 15,17,18, 19,20,21, 22,23,27, 28,29

Pinus taeda **(S)** **Family:** ***Pinaceae***

(LOBLOLLY PINE, TAEDA PINE) (EXOTIC)

Description: Sapwood often very wide, yellowish to buff in colour. Heartwood pink to light brown. Grain straight. Texture medium to coarse. Wood resinous, with conspicuous resin ducts. Knots often associated with resin streaks. Growth rings very prominent. A native of the eastern and southern United States of America. Best suited to the coastal belt and foothills up to approximately 1500m (5000 feet) altitude. Established successfully on the coast of Uruguay. In Brazil, a 21 year-old stand had a mean height of approximately 23m (75 feet) and a diameter of 435mm (17 inches). Trees grow best on well drained, moist sites, but tolerate drier, gravelly soils. Branching more persistent than in SLASH PINE (*Pinus elliottii*). The fastest-growing of the southern pines. Often sold in mixed parcels with SLASH PINE and other pines under the name of yellow pine.

Characteristics: Timber is soft and moderately strong. Working properties and strength vary with age and density. Logs easily discoloured by staining fungi and must be converted soon after felling. Seasons fairly well with little twist or warp. Knots commonly cause raising of the grain in planing. Finished quality of stock often spoiled by knot chipping. Paints and glues satisfactorily. Screws well. Damage by pinhole and furniture borers may occur. Very susceptible to termite and marine borer attack. Sapwood permeable, heartwood generally moderately resistant to impregnation with preservatives. Reasonably good steam bending timber, but excessive resin exudation may occur during the process. Preferred to SLASH PINE for pulping, being less resinous.

References: 2, 18, 22, 36, 66, 87, 91, 106, 110, 124, 125, 127, 129.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.4-0.9 (1¼-3)	1 (Immature) 20	5+ (Below) 7	S7	2-4	4	N	2,4,8,12, 13,15,17,
		24 (Native)	7+	S5 S5				20,21,22, 23,25,27

Piptadenia macrocarpa (H) **Family: *Mimosaceae***

(CURUPAY)

Description: Sapwood is white-yellow or pale pink. Heartwood pale brown-pink, darkening to uniform reddish-brown on exposure, and with darker coloured or almost black streaks. Grain diagonal to interlocked. Texture fine and even, appears oily. Odour and taste not distinct. Bark contains about 14% of tannin. Boles reasonably straight and clear up to 20m (65 feet) in length. Species grows moderately fast. Suitable for plantation planting. Common in lowland forests.

Characteristics: Timber is very hard and heavy. Highly resistant to shock. Dries very slowly with little tendency to distort. Tends to split and check during kiln-drying especially thick stock. Difficult to work. Severe blunting effect on cutting edges. Tooth vibration and overheating may occur in sawing. In planing, a 10° or 15° cutting angle necessary for material with interlocked grain. Turns well. Stains and polishes satisfactorily, only a small amount of filler being required. Pre-boring necessary for nails, as the timber is very resistant to penetration and splits easily. Moisture movement medium. Not attacked by pinhole borers, probably resistant to termites, but damage by longhorn borers possible. Heartwood extremely resistant to preservative treatment.

References: 1, 6, 8, 20, 22, 27, 35, 43, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25 (82)	0.6-0.9 (2-3)	1 2	10 9+	S1 S3	4-5	1	S	1,2,3,4, 5,6,7,8, 9,11,17, 20,21,23, 28

Piptadenia rigida **(H)** **Family:** ***Mimosaceae***

(ANGICO)

Description: Sapwood is yellowish or pinkish-grey, not well defined. Heartwood pale reddish-brown often marked with darker uniform stripes. Grain interlocked. Texture medium to fine. Lustre medium. No odour and taste. Growth rings poorly defined. Bole usually straight and free of branches up to 15m (50 feet) in length. Not heavily buttressed. Species found in mixed hardwood forests at low altitudes and moderately deep soils. Bark contains about 48% tannin.

Characteristics: Timber is hard, strong, stiff and heavy. Seasons relatively easily. Must be dried slowly to avoid degrade. Works moderately well with most tools, but interlocked stock may cause difficulty in planing. Sanding and filling necessary to obtain good finish. Takes a high polish. Difficult to nail and screw - pre-boring advisable. Resistant to fungal and insect attack. Weathering properties very good.

References: 1, 6, 7, 9, 20, 32, 33, 53, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	1.2 (4)	2 8 1	10 8+ 9	S3 S2 S3	5	2	(S)	1,2,3,4, 5,6,7,8, 9,10,17, 20,21,23, 28

Piratinera guianensis **(H)** **Family:** ***Moraceae***

(Syn: ***Brosimum guianense*****)**

(SNAKEWOOD)

Description: Sapwood is 120mm (4¾ inches) or more thick, light yellow to nearly white, and often poorly demarcated. Heartwood dark red or reddish-brown with irregular black radial speckles or black vertical stripes, resembling letters or the markings of a snake. Wood from the same species or even the same tree may be plain, without any markings. Lustre medium. Grain straight and finely textured. Odour and taste not distinct. Bark contains a thick, sticky, white latex. Boles 12 to 15m (40-50 feet) long, cylindrical, without buttresses but usually with swollen base. Species found occasionally in rain and marsh forests.

Characteristics: Timber is very hard, heavy and very strong, but brittle. Should be dried carefully and in small pieces because of development of excessive moisture gradients. Difficult to work on account of its hardness and density. Turns well. Finishes smoothly and takes a high natural polish. Takes nails and screws poorly. Inclined to splinter and split easily. Very resistant to termite and moderately resistant to marine borer attack. Stable. Difficult to steam bend without buckling. Occasionally sawn into thin veneers for expensive cabinet work.

References: 1, 3, 10, 20, 23, 35, 44, 47.

TREE		PROPERTIES						USES
Height m (ft)	Diem. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24 (80)	0.3-0.6 (1-2)	11,12, 13 1	10+	S1	5	1	(N)	8,9,10, 12,14,17, 20,27,28

Pithecellobium saman **(H)** **Family:- *Mimosaceae***

(Syn. *Samanea saman*)

(SAMAN, RAIN-TREE)

Description: Sapwood 25-50mm (1-2 inches) wide, white to yellow or light cinnamon and clearly distinct. Heartwood dark chocolate brown when freshly cut, turning to a light brown when seasoned and often marked with darker streaks. Growth rings not distinct unless terminal parenchyma noticeable. Gum ducts absent. Lustre medium to high. Grain straight to wavy or irregular, texture medium to coarse. Odour and taste not distinct. Bole relatively short. Usually occurs in open areas and occasionally along streams in the forest. Grows fast in zones with rainfalls up to 2550mm (100 inches). Commonly planted as a shade tree. Now established all over the tropics.

Characteristics: Timber is soft, light and comparatively weak. Seasons slowly and with considerable degrade. Should be dried carefully. Saws and machines easily. Dry material with irregular grain can be troublesome on occasions but green stock generally works to a good finish in planing. Care required to obtain clean cuts in boring and mortising. Turns poorly. Varnishes well and takes an excellent finish. Glues satisfactorily. Good resistance to screw splitting. Moderately resistant to termites. Durability ratings very variable, depending on area of origin. Liable to sap-stain.

References: 1, 17, 19, 36, 38, 45, 66, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-38 (100-125)	0.9-2 (3-6½)	9,43,44 45 (Exotic)	7+	S7	2	2-4	S	2,4,8,12, 15,17,18,
			7	S7				20,28,31, 32

Plathymenia reticulata (H) **Family:- *Mimosaceae***

(VINHATICO)

Description: Sapwood narrow, and yellowish-white. Well demarcated from the yellow or orange brown heartwood, darkening on exposure to deep red-brown. Lustrous. Often striped with lighter and darker shades. Grain straight or interlocked. Texture medium to slightly coarse. Growth rings shown as darker zones owing to increased fibre density. Lumina with brown gum. Numerous crystals present in cells. Odour and taste not distinct. Boles straight, clear and cylindrical, 20 to 24m (65 to 80 feet) in length, and unbuttressed.

Characteristics: Timber is soft to moderately hard. Seasons readily without serious degrade. Somewhat difficult to saw but good planed surfaces obtained. Works easily with both hand and machine tools. Sharp tools essential for good results. Finishes very smoothly and polishes well after filling. Takes and holds nails and screws well. Stable. Virtually resistant to termite attack.

References: 1, 7, 10, 20, 23, 27, 47, 66, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
38 (125)	0.9 (3)	1	6+	S5	2	3-4	S	2,4,6,8, 12,17,18, 20,28

Platonia insignis (H) **Family:- *Guttiferae***

(PAKURI, BACURY)

Description: Sapwood 30-90mm (1¼ to 3½ inches) wide, yellowish-white to yellow-brown and clearly demarcated. Heartwood dark yellowish-brown with greyish parenchyma markings in form of streaks and striping. Lustre medium to low. Grain generally straight, occasionally irregular. Texture medium. Growth rings indistinct. Odour and taste not distinct. Pores sometimes contain a yellow substance. Bole cylindrical, well formed and clear of branches - up to 21m (70 feet) in length. Trunk unbuttressed, or with low and thick buttresses. Species occurs in high savanna forests and rain forests. Bark rich in latex and fruits edible.

Characteristics: Timber is moderately difficult to air-season. Must be dried slowly and carefully. Moisture movement comparatively high. Stock works fairly easily with both hand and power tools. Finishes smoothly and takes a good polish. Takes nails poorly and pre-boring necessary. Resistant to damage by termites. Good weathering properties. Very suitable for tight cooperage. Rather unstable in use.

References: 1, 20, 38, 44, 49, 50, 52, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-30 (90-100)	0.6-0.9 (2-3)	11	9	S1	4-5	2	S	2,4,6,8, 12,15,18, 20,25,28

Podocarpus nubigenus (S) **Family:- *Podocarpaceae***

(MAÑI0)

Description: Sapwood and heartwood not well defined. Wood is normally a uniform pale yellow to yellowish-brown in colour, though occasionally slightly streaked with darker colour. Grain straight, texture fine and uniform. Growth rings not distinct. Bole fairly well-formed and up to 15 m (50 feet) in length. Occurs singly or in small groups on swampy land in the rain forests but tends to form pure stands in some areas. Suitable for ornamental planting purposes.

Characteristics: Logs are liable to sapstain and should be dipped into an anti-stain solution after felling. Also attacked by termites, pinhole borers and longhorn beetles. Timber seasons without difficulty at low temperatures, otherwise it tends to check and distort. Care must be taken to stack properly. Works very easily by hand and machine tools. Generally machines to a good, clean finish when cutting edges are kept sharp. However, care needed to prevent breaking away at the exit side when boring or mortising. Stains and polishes satisfactorily. Takes paints and varnishes well. Tends to split in nailing or screwing unless holes are pre-bored. Fairly permeable to preservative treatment. Wearing properties low to moderate. Well-shaped cylindrical logs might well be rotary-cut for veneer. Timber acid resistant. Stable after seasoning.

References: 6, 13, 27, 35, 47, 88, 91, 92, 93, 94.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24	0.6-0.9	10	6+	S6	4-5	3	N	2,4,6,7,
(80)	(2-3)	2	7	S6				8,12,17, 20,21,25

Pouteria melinonii **(H)** **Family: *Sapotaceae***

(Syn. *Micropholis guyanensis*)

(KONOKO)

Description: Sapwood 125 to 175mm (5-7 inches) wide and not well differentiated from the heartwood which is yellow to greyish-brown, sometimes with a reddish or greenish tinge. Lustre medium. Grain straight, texture fine. Growth rings indistinct. Wood contains silica. Boles straight, cylindrical and up to 18m (60 feet) in length. Occurs in rain, marsh and savanna forests.

Characteristics: Green timber should be dipped in anti-stain mouldicide solution to prevent stain and mould development in early stages of seasoning. Dries rapidly with moderate warping and checking and some casehardening. Slow drying recommended to minimize degrade. Machines well, yielding smooth surfaces in sawing, planing and boring operations. Reported to be resistant to teredo but prone to termite attack. Heartwood resistant to preservative treatment, sapwood permeable. Suitable for marine piling.

References: 44, 81, 83, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.7 (2¼)	12	8+	S2	4-5	3	(S)	1,2,3,4, 8,9,10, 12,17,20, 28

Prioria copaifera **(H)** **Family:- *Caesalpiniaceae***

(CATIVO)

Description: Sapwood may be up to 250mm (10 inches) wide, buff or pale pink or reddish in colour. Heartwood brownish-tan irregularly pigmented, often attractively streaked and sometimes with an almost black core. Lustre low. Grain straight and uniform. Texture medium and uniform. Gum ducts present. Bole up to 12 or 18m (40-60 feet) in length, clear and straight. Little or no buttresses. Logs often contain bands of tension wood. Found in low coastal plains, and on wet sites along rivers. Grows in nearly pure stands.

Characteristics: Logs must be processed or protected with preservatives soon after felling to avoid losses due to insect and fungal attack. Timber generally dries easily and rapidly with little or no degrade. Darker coloured material requires careful seasoning to prevent collapse. Owing to gum exudations high temperatures must be used in the final stages of kiln-drying. Machines easily in all operations, but sharp tools are needed otherwise surfaces may tend to be woolly. Blunting effect on cutting edges fairly severe. Tension-wood makes rip-sawing difficult because of its pinching effect on saws and resulting overheating of teeth. Support required at the exit side in boring and mortising. Generally, timberworks easily producing a high lustrous finish. Peels well. Reported to be very susceptible to termites, pinhole borers and marine borers. Rated fair to good for steam bending. Weathers moderately well. Very good dimensional stability.

References: 1, 2, 5, 27, 46, 47, 61, 76, 78, 83, 87, 96.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	1.5 (5)	26 8	6 6+	S7 (S6)	2-3	4	S	8,12,13, 15,17,18, 19,32

Prosopis juliflora **(H)** **Family:- *Mimosaceae***

(Syn. *Neltuma juliflora*

(MESQUITE)

Description: Sapwood generally narrow, pale yellow in colour and well demarcated from the yellowish to dark brown heartwood. Vessel lines usually conspicuous. Not highly lustrous. Grain straight to wavy. Texture medium to coarse. Growth rings distinct. Odour of fresh cut wood fragrant, taste not distinct. Deciduous tree with a short and twisted bole. Cultivated as an ornamental, but also used for afforestation and conservation works in dry areas. Moderately fast-growing.

Characteristics: Timber is hard, heavy, tough and strong. Tends to develop small checks when air-drying. Works easily with most tools, finishes smoothly, but does not take a high polish. Pre-boring necessary for nails. Very stable. Moderately prone to termite attack. Reported to be susceptibleto pinhole borers when freshly felled. Produces good charcoal and firewood. Pods make an excellent fodder.

References: 1, 20, 36, 66, 83, 100, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
12 (40)	1.2 (4)	8,9,30	9	(S3)	(5)	2	(S)	1,3,5,7, 8,17,20, 21,23,28

Protium decandrum (H) **Family:- *Burseraceae***

(KUROKAI)

Description: Sapwood about 25mm (1 inch) wide, not clearly demarcated from the heartwood, and pink or occasionally pale yellow in colour. Heartwood pinkish-brown, sometimes with dark reddish-brown, irregularly spaced streaks. Grain straight or shallowly interlocked. Texture fine and even. Growth rings not readily evident, but may be marked by narrow zones of denser tissue. Bark contains considerable quantities of an aromatic resin. Bole usually well formed, sometimes fluted, up to 18m (60 feet) in length and generally 1m (3¼ feet) or less in diameter and buttressed. Grows in marsh and most heavy types of forests.

Characteristics: Conversion of logs can be rather difficult, as resin tends to build up and clog saw teeth. Timber dries fairly rapidly with a marked tendency to warp and for any original shakes to extend during drying. Works fairly readily with machine tools and has moderate blunting effect on cutting edges. In moulding and drilling, the timber requires support at tool exits. Planes to a reasonably good surface, particularly with a cutting angle of 20°. Stains and polishes satisfactorily, but requires a little filling. Liable to split in nailing, preboring advisable. Gluing properties variable. Damage by pinhole borer sometimes present. Very susceptible to termite attack. Heartwood extremely resistant to preservative treatment, sapwood moderately resistant. Steam bending properties moderate. Moisture movement medium. Resin used in native medicine and for making incense.

References: 8, 13, 38, 43, 66, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27 (90)	1 (3¼)	11 9	7+ 8	S4 S3	3	4	(S)	2,8,12, 15,17,20

Protium neglectum (H)

Family:- *Burseraceae*

(ANIME)

Description: Sapwood rose coloured, merging gradually into the reddish-brown or rose-brown heartwood. Lustre medium to high. Grain straight. Texture moderately fine. Odour and taste not distinct. Growth rings distinct. Bole may be up to 21m (70 feet) long.

Characteristics: Timber is hard and heavy. Air-seasons well. Moderately difficult to work by hand but machines well. Planes nicely if grain is straight, but requires sanding and filling to obtain a good finish. Polishes satisfactorily. Does not take nails and screws easily but holds them well. Glues satisfactorily. Weathering properties poor. Moisture movement low. Heartwood resistant to impregnation with preservatives. Suitable for peeling and slicing.

References: 33, 148.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18-30 (60-100)	0.4-0.6 (1¼-2)	8 9	8+ 8	S2 S3	4	(3)	(S)	1,2,3,4, 7,8,17, 20

Pseudosamanea guachapele (H) **Family: *Mimosaceae***

(Syn. *Albizia longipedata*)

(FRIJOLILLO)

Description: Sapwood narrow, whitish and rather sharply demarcated. Heartwood uniform yellowish-brown or rich brown with a golden lustre. Grain sometimes straight, but generally interlocked and producing a stripe figure on radial surfaces. Texture medium to coarse, uniform. Species grows rapidly and develops a large, well-formed bole with only insignificant buttresses. Occurs in tropical forests, generally in dry areas or in well-drained situations, on soil types ranging from sandy loam to gravel and rocks. Seeds naturally in openings, pastures and abandoned fields. Often used for shade in coffee plantations. Naturally fire resistant.

Characteristics: Timber air-seasons moderately fast with some warping and slight checking. Low shrinkage. Works easily with all tools. Sawn surfaces are rather woolly, but finishes smoothly giving an attractive surface after sanding. Glues well. Heartwood extremely resistant to preservative treatment. Weathering characteristics excellent.

References: 1, 27, 76, 77, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6 (2)	15	8	S5	2	2	S	2,3,4,5, 6,7,8,12, 17,20,21, 23,28

Pterocarpus officinalis (H) **Family:-** ***Papilionaceae***

(Syn: ***P. draco*****)**

(CORKWOOD, WATRABEBE)

Description: Sapwood is wide and whitish to pale yellow in colour. Heartwood dark brown or purplish. Lustre medium. Texture medium to coarse. Grain straight, sometimes irregular. Bole often curved or twisted and fluted, and up to 18m (60feet) in length. Prominent buttresses, on large trees, up to 4.5m (15 feet) high. Species found in low swamp and riparian forests and along stream banks in mountains. Often forms dense nearly pure stands. Trees are planted for shade and ornamental purposes.

Characteristics: Timber generally light, very soft and comparatively weak, but all properties are highly variable. Seasons easily but care must be taken to avoid stain during the drying process. Works easily with all tools and finishes smoothly. Susceptible to marine borer, termite and pinhole borer attack. Suitable for floats, lifebelts and cheap furniture. Resin used for medicinal purposes.

References: 1, 44, 49, 50, 87, 100.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15-27 (50-90)	0.6-0.9 (2-3)	9 23	7+ 6+ (Immature)	S5 S7 (Below)	4-5	4	S	8,15,17, 20,22,30, 31

Qualea albiflora (H) **Family:- *Vochysiaceae***

(Syn: *Q. glaberrima*)

(MANDIOQUIERA)

Description: Sapwood 30 to 65 mm (1¼-2½ inches) wide and yellowish-grey to cream in colour. Heartwood grey to pale reddish-brown, fairly distinct from the sapwood. Lustre high. Texture medium. Grain straight or somewhat interlocked, in which case a wavy figure is present on tangential surfaces. Bole cylindrical and clear up to 18m (60 feet) in length. Thick buttresses present. Species common in rain forests on higher, non-inundated areas.

Characteristics: Timber dries fairly well with slight end checking and warping. Sapwood susceptible to staining during early stages of air-drying. Moderately hard to work. Noticeable dulling effect on cutting edges, producing a woolly finish unless cutters are kept sharp. Takes nails and screws well. Peels and glues satisfactorily. Weathering characteristics fair. Moderately prone to termite attack, liable to damage by marine borers. Used for marine piling and decking in non-teredo areas.

References: 38, 44, 50, 66, 76, 78, 82, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.8 (2½)	12,1	7+	S4	3-4	3	(S)	1,2,4,7, 8,11,12, 15,17,20, 23

Qualea rosea (H) **Family - *Vochysiaceae***

(GRONFOELOE)

Description: Sapwood up to 50mm (2 inches) wide, pale yellow to light brown, and not sharply differentiated from the pinkish-brown heartwood. Lustre high. Grain straight to slightly interlocked. Texture medium to coarse. Vessel lines prominent on longitudinal surfaces. Growth rings indistinct, but concentric bands are delineated producing conspicuous parabolic figure on tangential surfaces. Vessels may contain a white, crystalline material. Bole well formed and free of branches, up to 18 to 21m (60-70 feet) in height. Species usually found in rainforests but in some areas it may grow on sandy or clayish soils.

Characteristics: Timber dries rapidly, but develops moderate warping, slight end and surface checking and casehardening during the air-seasoning process. Care in stacking and mild drying conditions can reduce degrade. Stock moderately difficult to work and quickly dulls cutting edges due to its silica content. Saws readily and planes smoothly unless wavy material present, which may cause chipped or torn grain. In boring, surfaces are inclined to be fuzzy and care must be taken to avoid tearing. Takes nails and screws well. Glues satisfactorily, but requires care in polishing. Moderately resistant to termite attack. Reported to be moderately impermeable to preservative treatment. Weathering characteristics poor.

References: 10, 38, 44, 50, 53, 81.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-0.8 (2-2½)	12 13	7+ 8	S4 S4	4-5	3	(S)	1,2,4,5,7, 8,12,17, 20,23

Rhizophora mangle (H) **Family:- *Rhizophoraceae***

(RED MANGROVE, MANGRO)

Description: Sapwood very narrow, not well demarcated from the heartwood, and yellowish-white or grey in colour. Heartwood uniform pale red, dark red or reddish-brown, sometimes with purplish cast or occasionally with darker streaks. Not highly lustrous. Texture fine. Grain straight to very irregular. Bole free of branches for 9 to 12m (30-40 feet) in height. Stem supported on aerial roots, 1.8 to 3.0m (6-10 feet) high. Species common in marine and tidal swamps, along the rivers and estuaries, where it forms dense and almost pure communities. A very slow-growing species. Widely distributed throughout the world.

Characteristics: Timber liable to split and warp during the seasoning process. Saws and works fairly well despite its high density, but can be split easily with wood-working tools. Planes easily but occasional raised grain may occur. Pre-boring necessary in nailing, but holds nails well. Difficult to glue. Finishes smoothly and takes a high polish. Good wearing and weathering characteristics. Moderately resistant to termites but prone to marine borer attack. Impermeable to preservative treatment. Bark rich in tannin and produces a dye. A very good fuel and charcoal wood. Promising pulp material.

References: 1, 18, 20, 49, 50, 66, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6 (2)	34,37 38,39 8	10 9+ 10	S2 S2 S1	5	(2-3)	(N)	1,2,3,5, 6,7,9,10, 13,16,20, 21,23,25, 28,32

Salix humboldtiana **(H)** **Family:- *Salicaceae***

(SAUCE)

Description: Sapwood whitish, not well demarcated from the pale pinkish-white heartwood. Moderately lustrous. Grain normally straight. Texture fine and even. Bole may be up to 12m (40 feet) in length. Species grows along river-banks. Natural regeneration excellent on sandy soils. Often planted along streams and irrigation ditches to prevent erosion. A fast-growing, gregarious species.

Characteristics: Timber seasons quickly and well if quartersawn. Works very easily with most hand and machine tools. Finishes smoothly if sharp cutters are used. Glues and nails satisfactorily. Very prone to marine borer, termite and blue stain attack. Sapwood permeable to impregnation, heartwood resistant. Makes good firewood. Bark rich in tannin. Both bark and leaves contain a bitter extract (salicin), reputed to have various therapeutic properties.

References: 1, 4, 6, 19, 20, 35, 66.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20 (65)	1 (3¼)	2	6+	S7 (Below)	3-5	4	S	2,7,8,11, 12,13,15, 17,20,27, 31

Sapium biglandulosum (H) **Family:- Euphorbiaceae**

(LECHERO)

Description: Sapwood 12 to 25mm (½-1 inch) wide and cream coloured. Heartwood pale brown and not lustrous. Grain straight to slightly interlocked. Texture medium. Growth rings indistinct. Bole well-formed and upto 21m (70 feet) long. Species found in savanna forests and on mountain slopes. May grow in secondary formations in some areas.

Characteristics: Timber usually attacked by blue stain, so logs must be converted as soon as possible or dipped in an anti-stain solution. Air-dries rapidly with little degrade. Works easily with hand or machine tools. Saws and planes to a fairly smooth surface. A fuzzy surface may occur in boring, but the grain does not tend to tear. Likely to split in nailing; pre-boring necessary. Glues well. Peels moderately well without heating, but may split during handling. Reported to be low in resistance to insect attack.

References: 21, 48, 49, 75, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-0.9 (2-3)	9	7	S6	3	4	S	2,8,12,13 15,17,18, 20,22,30, 31

Schinopsis balansae (H) **Family:- *Anacardiaceae***

(QUEBRACHO COLORADO)

Description: Sapwood 30 to 80mm (1¼-3¼ inches) wide, well demarcated from the heartwood, and pale pink in colour. Heartwood chestnut brown when freshly cut, turning to dark deep red on exposure. Often slightly streaked. Texture fine and even. Grain diagonal to interlocked. Odour absent, taste astringent. Heartwood contains up to 35% of tannin. Bole 6 to 9m (20-30 feet) in length, straight and moderately cylindrical. Species found in swampy lands in small groups or mixed with other hard-woods. Prefers very wet clay soils. Natural regeneration good in some places. Large trees usually affected by heart rot.

Characteristics: Timber is extremely hard, heavy and strong, but brittle. Care must be taken in seasoning to avoid warping and checking. Difficult to saw and very difficult to work. Finishes smoothly and takes a high natural polish. Splits readily. Not of the class of timbers treated with preservative, because of its high tannin content. Makes good firewood. Mainly used for tannin extraction. Very resistant to fungal attack. Highly durable in fresh-water. Dust may cause asthma, bleeding of the nose and conjunctivitis.

References: 1, 4, 6, 20, 47.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
25 (82)	0.3 0.9 (1-3)	2	10+	S2	(5)	1	S	1,3,5,7, 8,10,20, 21,23,28

Schinopsis lorentzii (H) **Family:- *Anacardiaceae***

(QUEBRACHO)

Description: Sapwood 25 to 75mm (1-3 inches) wide, whitish-pink and sharply defined. Heartwood chestnut-red in colour, sometimes with black streaks. Moderately lustrous. Texture fine and even. Grain interlocked. Odour not distinct, taste astringent. Heartwood contains 22 to 24% of tannin. Bole moderately straight and clear of branches, 8 to 10m (26-33 feet) long. Species found on dry plains, in small groups mixed with other hardwoods in open stands. Prefers clay or clay-sandy soils. Large trees may be attacked by heart rot.

Characteristics: Timber needs care in seasoning. Has marked tendency to warp and check especially if converted into thin boards in the green state. Rather difficult to work with both hand and machine tools. Pre-boring necessary for nailing and screwing. Tends to chip during drilling and mortising. Stains well and takes a high polish. Stable. Not readily attacked by insects and it is not normally given a preservative treatment. Fire resistant. Makes excellent firewood of low combustion and high calorific power. Source for tannin extraction. Dust may cause headache, dermatitis and asthma.

References: 1, 4, 6, 10, 20, 22, 23, 27.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
20-25 (65-82)	0.3-0.8 (1-2½)	2	10	S2-S3	(5)	1	(S)	1,2,3,4, 5,7,9,10, 20,21,23, 28

Schizolobium parahybum **(H)** **Family:- *Caesalpiniaceae***

(GUAPURUVU)

Description: Sapwood almost white, not well demarcated from the heartwood, which is yellowish-white with a pale brown or pinkish tinge. Moderately lustrous. Odour and taste not distinct. Texture moderately coarse, uniform. Grain straight to irregular. Tyloses common. Growth rings distinct. Bole usually long and well formed. Species found in coastal, mixed hardwood forests. Very fast-growing species suitable for plantations. Under favourable conditions, a height of 15m (50 feet) and diameter of 200mm (8 inches) may be attained in 2½ years. Planted for ornamental use in gardens and a shade tree in coffee plantations.

Characteristics: Timber is light and, soft. Air-seasons easily and well without staining, checking or warping. Material from the centre of very wide logs may tend to collapse during air-seasoning or kiln-drying. Sawn surfaces rather woolly, but finish smoothly. Works easily with hand and machine tools. Takes nails and screws easily but has poor holding power. Glues readily. Peels very well, but tension wood or brittle heart may cause difficulties. Reported to be not susceptible to insect attack and to be durable in salt water. Sapwood permeable. Timber used for native huts, canoes, and cheap furniture.

References: 1, 16, 113, 114, 115.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	1 (3¼)	1	4	S7 (Below)	1-3	4	S	2,8,12, 13,17,18, 20,27,29, 30,31

Sclerolobium melinonii (H) **Family:-** ***Papilionaceae***

(DJEDOE, JAWALEDAN)

Description: Sapwood 25 to 75 (1-3 inches) wide, paler in colour than the heartwood which is uniform pale buff to dark yellowish-brown, sometimes with a pinkish or olive hue. Lustre high and satiny. Grain straight to interlocked, producing stripes on longitudinal surfaces. Texture medium to coarse. Growth rings distinct due to wide bands of latewood. Bole clear and cylindrical, up to 24m (80 feet) long. Species found in rainforests and on the edges of creek swamps. Occurs also in savanna forests.

Characteristics: Timber seasons rapidly with moderate warping, slight checking and casehardening. Decreasing the rate of drying tends to minimize seasoning defects. Moisture movement moderate. Stock fairly easy to work. Sawn surfaces somewhat woolly but finish smoothly unless material is severely interlocked. Takes nails readily without splitting. Bores easily with a smooth cut. Stable when manufactured. Timber not liable to termite and marine borer attack. Resistant to preservative treatment. Dust from machining operations is extremely irritating to nose and throat. Used as raftwood. Makes excellent charcoal.

References: 44, 50, 81, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.7 (2¼)	12	7	S5	4-5	4	S	8,12,15, 17,20,22

Simaruba amara **(H)** **Family - *Simaroubaceae***
(Syn *Quassia simaruba*)

(SIMARUBA, MARUPA)

Description: Sapwood. and heartwood not defined. Wood yellowish-white or uniform lightyellow. Lustre high. Texture medium and uniform. Grain usually straight. Growth rings indistinct. Without odour but with a slightly bitter taste. Bole straight, cylindrical, unbuttressed and steeply tapered, frequently 21 to 24m (70-80 feet) long. Occurs in rain and high savanna forests. Prefers sandy soils.

Characteristics: Timber dries easily and rapidly with little degrade, although prone to blue stain before and during drying. Works easily with both hand and machine tools but inclined to be brittle. Saws and planes well and finishes to a clean surface. Sharp tools and high speeds essential in turning. Easy to paint, stain or varnish. Glues well. Takes and holds nails and screws satisfactorily. Good peeling characteristics. Susceptible to termite and marine borer attack, but permeable to preservative treatment. Weathering characteristics relatively poor, hence unsuitable for use in prolonged exposed situations.

References: 1, 5, 20, 35, 36, 38, 42, 44, 49, 50, 51, 52, 87, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
36 (120)	0.6-0.9 (2-3)	12 9 46	6 5+ 5	S7 S7 S7	2	4	S	8,12,13, 14,15,17, 18,19,20, 22,27,30, 32

Spondias mombin (H)
(Syn: *S. lutea*)

Family:- ***Anacardiaceae***

(MOPE, JOBO)

Description: Sapwood. up to 100m (4 inches) wide and difficult to distinguish from the cream to golden-brown heartwood. Lustre medium. Grain straight or slightly interlocked. Texture coarse to medium. Numerous pores, readily visible on end surfaces, appear on longitudinal surfaces as distinct grooves or as slightly darker lines. Wood contains a sticky resin. Bole cylindrical, unbuttressed, basally swollen and 18 to 24m (60-80 feet) in length. Especially found in open, upland forests and on ridges. Very commonly planted as a shade tree and for fencing. Also grows in Africa.

Characteristics: Logs liable to blue stain and should be treated or processed as soon as possible after felling. Timber seasons at a moderate rate with some warping, and end and surface checking. Works well with hand and machine tools. Saws easily and fast. Planes to a good finish but boring may produce fuzzy surfaces. Sands fairly well. Good resistance to nail and screw splitting. Good jointing material. Susceptible to termite attack, as well as by marine and fresh water borers. Damage by pinhole borer may also occur. Sapwood permeable to preservative treatment, heartwood moderately resistant. Peels well. Fruits edible. Leaves used for medicinal purposes.

References: 1, 18, 27, 45, 49, 66, 75.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40 (130)	1.2 (4)	9 8 34,22 35 1	6 6 7+ 7 6+	S7 S7 (Below) S6 S7 S7	2-3	4	S	2,6,8,9, 12,13,15, 17,18,19, 20,22,23, 27,28,31

Sterculia pruriens (H) **Family:- *Sterculiaceae***

(MAHO)

Description: Sapwood about 50mm (2 inches) wide, whitish and usually not well defined from the whitish to pale brown heartwood. Fairly lustrous. Grain usually straight, texture medium, and even. Rays are clearly visible and very prominent on the radial surface. Bole is cylindrical, 18 to 21m (60-70 feet) long, with a small taper. Species is found in rain forests.

Characteristics: Blue stain may occur if seasoning is delayed or prophylactic treatment not applied. Timber air-seasons fairly rapidly but with tendency to warp. Moderate drying conditions reduce degrade. Works easily with both hand and machine tools, and without significantly blunting the cutting edges. Surface tends to be woolly but good results usually obtained with sharp cutting edges. Saws used for medium density hardwoods recommended, such as circular ripsaws with 54 teeth and 20 to 25 degree pitch. Nails hold firmly and cause no splitting. Timber stains and polishes well if a fair amount of filler is used. Moisture movement high. Very prone to termite and marine borer attack. Sapwood and heartwood permeable to preservative treatment. Not suitable for solid bent work. Yields a very good quality paper-pulp.

References: 1, 13, 35, 38, 49, 64, 66, 67.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6 (2)	11,9	7+	S5	5	4	S	2,8,13, 15,17,20, 30

Swartzia bannia (H) **Family:-** ***Papilionaceae***

(BANNIA)

Description: Sapwood less than 25mm (1 inch) wide, yellow to light yellow-buff in colour and sharply demarcated from the deep purple-brown, almost black heartwood. Moderately lustrous. Texture very fine. Grain interlocked, producing a prominent striped figure. Ripple marks conspicuous on longitudinal surfaces. Vessels contain white deposits. Growth rings indistinct. Bole unbuttressed, deeply fluted and 6 to 10m (20-33 feet) long. Occurs in savanna and dry evergreen formations and high forests.

Characteristics: Timber is one of the densest and strongest known. Has outstanding hardness, compression parallel to the grain and shearing characteristics. Capable of drying at a fast rate with moderate checking and warping and a slight tendency to caseharden. A slower drying rate reduces this degrade. Difficult to saw and hard to work because of its extremely high density. However, very smooth surfaces are obtainable in sawing or planing. Bores cleanly and turns well. Takes a high polish. Pre-boring essential for nailing and screwing. Very resistant to termites but liable to marine borer attack. Heartwood impermeable to preservatives. Wearing characteristics excellent. Highly resistant to shock. Fine dust developed by machining operations may cause irritation to nose, throat and eyes.

References: 44, 49, 81.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
18-24 (60-80)	0.5 (1½)	12	10+	S1	3-4	1	S	1,3,4,5, 7,8,9,14, 16,21,23, 24,27,28

Swartzia leiocalycina* (H)** **Family:- *Papilionaceae

(WAMARA)

Description: Sapwood commonly 65 to 75mm (2½-3 inches) wide, nearly white or yellow and clearly defined. Heartwood dark brown to pale reddish-purple or purplish-brown, occasionally with dark olive or purplish-brown stripes. Texture medium to very fine. Grain generally straight but variable. Growth rings clearly visible. Odour and taste not distinct. Lustrous. Bole clear of branches up to about 20m (65 feet) above the low buttresses. Found in more than one type of forest but grows mainly in mixed rain forests.

Characteristics: Timber is very hard, heavy, strong, tough and resilient. Dries slowly with considerable surface checking and end splitting, but distortion is not generally serious. Difficult to work with hand and machine tools, and has a severe blunting effect on cutting edges. In planing, a reduction of the cutting angle to 20° recommended to obtain good surfaces. Turns excellently and finishes smoothly. Does not take stains well but polishes to a good sheen. Preboring necessary for nailing and screwing. Timber resistant to termites but presents little resistance to marine borers. Sometimes damaged by pinhole borers. Heartwood extremely resistant to preservatives, sapwood permeable.

References: 1, 8, 13, 38, 43, 49, 51, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5 (1½)	11 13	9+ 9+	S2 S1	3	1-2	(S)	1,2,3,4, 5,6,7,8, 9,10,11, 12,17,20, 21,23,28

Swartzia tomentosa **(H)** **Family:- *Papilionaceae***

(FERREOL)

Description: Sapwood 40 to 80mm (1½-3¼ inches) wide, light brown-yellow and sharply demarcated from the dark red-brown heartwood. Lustre medium to high. Texture fine. Grain straight to interlocked, producing a distinct ribbon figure. Growth rings indistinct. Bole up to 15m (50 feet) long, with low buttresses. Found in rain forests.

Characteristics: Timber is very hard, heavy, strong and stiff. Tends to check considerably in drying, and should be seasoned slowly and carefully. Fibre saturation point moderately low. Difficult to work, though finishes smoothly. Turns well and takes a high polish. Pre-boring essential for nails and screws. Very resistant to termites but prone to marine borer attack. Resistant to impregnation with preservatives. Very durable in exposed situations. Used in the round. Dust may cause irritation to mucous membranes in nose and throat.

References: 9, 44, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24 (80)	0.4 (1¼)	12	10	S1	5	1	(S)	1,2,3,4, 6,8,9, 10,11,14, 16,20,21, 23,27,28

Swietenia macrophylla (H) **Family:** ***Meliaceae***

(AMERICAN MAHOGANY)

Description: Sapwood generally 25 to 50mm (1-2 inches) wide, yellowish-white and clearly demarcated. Heartwood varies from pinkish to salmon when freshly cut, later turning pale reddish-brown with golden lustre. Texture moderately fine and uniform. Grain straight or interlocked; irregularities produce an attractive stripe figure on quarter-sawn surfaces. Occasionally mottled, fiddleback, raindrop, roey or curly figure present. Growth rings not always distinct. Vessels contain deposits of a dark gum; white deposits sometimes present. Bole cylindrical, straight, heavily buttressed and clear for 12 to 18m (40-60 feet) in length. Found in all forest types from the savanna to the rain forests, but mostly in mixed hardwood forest-belts along the rivers, on deep alluvial soils of good fertility. A fast-growing species suitable for plantations.

Characteristics: Logs susceptible to pinhole borer attack - must be protected with insecticides soon after felling. Timber seasons well and rapidly with very little degrade unless tension wood present. Works excellently with both hand and machine tools with very little dulling effect on cutting edges, but sharp cutters essential with woolly material. Cuts cleanly and gives excellent results in mortising, boring and turning. Nails and screws well with good holding power. Stains and polishes excellently. Glues well. Very satisfactory for slicing or peeling into veneer, but flitches frequently develop cracks if not softened properly. Reasonably good for steam bending. Moderately resistant to termite but quite susceptibleto marine borer attack. Heartwood extremely resistant to preservative treatment. A stable timber with excellent weathering properties.

References: 1, 3, 8, 14, 17, 20, 23, 31, 34, 35, 36, 38, 45, 55, 75, 76, 77, 83, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
24-30 (80-100)	1.2-1.8 (4-6)	1,15,9,8 6 43 (Exotic) 17 37	7 8 7 7+ 7	S6 S5 S6 S5 S5	2	2-3	S	2,4,6,8, 10,12,14, 15,16,17, 18,20,22, 27,28,32

Symphonia globulifera (H) **Family:- *Guttiferae***

(MANNI)

Description: Sapwood 40 to 75mm (1½-3 inches) wide, yellowish-white, grey or grey-brown in colour and sharply defined from the heartwood which is yellowish-brown or greenish-brown, with pink or greenish hue, or with stripes in these shades. Lustre medium to high. Abundant soft parenchyma tissue visible on clean-cut cross-sections as wavy, broken or continuous lines. Texture rather coarse. Grain typically straight. Growth rings indistinct or poorly defined. Green wood has "tarry" odour, but when dry no distinct odour or taste present. Wood contains a sticky yellow latex. Bole straight, slightly buttressed and 15 to 20m (50-65 feet) long. Common in mixed hardwood forests, swamp and marsh forests. Also found in tropical Africa. In swamp areas, the tree is stilt-rooted and develops elbow buttresses.

Characteristics: Air-seasons easily to moderately well, drying rapidly with a tendency to check, warp and caseharden. A slower rate of drying and end-coating of stock recommended to prevent seasoning degrade. Timber saws and works easily, with a moderate blunting effect on cutting edges. Turns, bores, sands and mortises very satisfactorily, but raised and chipped grain may occur in planing and shaping. Stains and polishes easily. Glues, paints and varnishes satisfactorily. Holds nails and screws well but splitting may occur during nailing. Reported to be non-resistant to termites and marine borers. Logs liable to pinhole borer damage. Sapwood resistant to preservative treatment, heartwood extremely resistant. Timber has good weathering characteristics and very good durability in fresh water. Peels and slices satisfactorily. A good substitute for AMERICAN MAHOGANY (*Swietenia macrophylla*). Latex and bark have various medicinal uses.

References: 1, 8, 13, 18, 20, 27, 38, 43, 44, 103, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.5-0.8 (1½-2½)	12 1,15 14 22 16	8 8+ 8+ 7+ 8	S3 S3 S4 S4 S4	5	1-2	S	1,3,4,5, 7,8,11, 12,13,17 18,20,21, 23,24,25, 27,28,31

Tabebuia guayacan **(H)** **Family:- *Bignoniaceae***

(Syn. *Tecoma guayacan*)

(GUAYACAN)

Description: Sapwood 50 to 75mm (2-3 inches) vide, creamy-white or yellowish and rather sharply demarcated. Heartwood olive-brown or dark brown often with lighter or darker fine striping, sometimes tinged with red. Appearance frequently oily. Yellow-green deposits (Lapachol) abundant. Lustre low to medium. Grain typically interlocked producing a fine, stripe figure on quarter-sawn surfaces. Texture fine to medium, moderately uniform. Growth rings usually distinct. Bole straight, cylindrical and may be free of branches for 12 to 15m (40-50 feet). Buttresses prominent but usually low. Found in virgin forests and on mountain slopes.

Characteristics: Timber is resilient and highly resistant to shock. Air-seasons reasonably fast with slight warping and moderate checking. Case-hardening may also occur. Reported to be rather difficult to work and inclined to splinter, but finishes very smoothly. Turns well and polishes nicely. Difficult to glue. Pre-boring necessary before nailing. Resistant to insect attack. Extremely resistant to impregnation with preservatives. Good wearing and weathering characteristics. Steam bending quality poor to fair. Suitable for pulp mill equipment such as beater liners, bed plates and agitator bars. Sawdust may cause dermatitis, disturbance of vision and shortness of breath in some workers.

References: 1, 20, 76, 77.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-1.2 (2-4)	15	10	S1	5	1	(S)	1,3,4,5, 6,7,8,9, 10,11,17, 21,23,25, 28

Tabebuia insignis* var. *monophylla (H) **Family: *Bignoniaceae***
(Syn. *T. longipes*)

(WHITE TABEBUIA, ZWAMP-PANTA)

Description: Heartwood yellowish or greyish-brown. Sapwood paler in colour and not well demarcated from the heartwood. Lustre medium to moderately high. Texture medium. Grain fairly straight. Odour and taste not distinct. Oil cells occasionally present. Buttressed up to 3 to 4m (10-13 feet) high. Boles free of branches up to 12 to 15m (40-50 feet) in length; not well formed and with steep taper. Occurs in swampy and marshy forests and wet savannas.

Characteristics: Timber is relatively hard, strong, and resilient. Seasons easily with only slight degrade. Stock springs badly when sawn green but saws and machines easily in the dry condition. Planes, shapes, bores, mortises and sands well with smooth clean edges. Finishes very smoothly and polishes excellently. Prone to termite and marine borer attack. Variable resistance to impregnation with preservatives. Suitable for packing cases and cheap furniture. Could be a good substitute for EUROPEAN ASH (*Fraxinus excelsior*).

References: 1, 38, 44, 49, 50, 87, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27 (90)	0.4 (1¼)	11 13	8 7+	S3 S4	4-5	3	S	1,2,3,4, 6,7,8,9, 10,11,12, 15,17,18, 20,27,28

Tabebuia ipe (H)

Family:- *Bignoniaceae*

(LAPACHO NEGRO)

Description: Sapwood relatively thick, yellowish-white and sharply differentiated. Heartwood greyish when freshly cut, darkening to greyish-greenor brownish-olive on exposure; sometimes slightly streaked. Texture fine and uneven. Grain rarely straight, usually interlocked to very irregular. Lustre medium. Odour and taste not distinct. Vessels of heartwood contain a yellow-green deposit (Lapachol). Bark contains around 5% of tannin. Bole straight, cylindrical, slightly buttressed and unbranched, 18 to 21m (60-70 feet) in length. Found mainly in mixed deciduous and evergreen forests, but may gregariously occur on steep rocky hillsides or in smaller numbers in lowland forests. Often planted as an avenue tree.

Characteristics: Timber is fairly easy to season, drying rapidly with very little warping and checking. Moderately difficult to work with machine tools. High resistance to cutting, resulting in severe blunting effect on edges. Finishes very smoothly. Difficult to nail; pre-boring necessary to avoid splitting. Turns well. Not resistant to termite and marine borer attack. Sapwood permeable, heartwood extremely resistant to impregnation. Very durable in non-teredo waters. Very good dimensional stability in use and highly resistant to shock. Makes good firewood. Often used in the round. Dust may cause irritation of skin in some workers.

References: 1, 2, 4, 5, 6, 13, 20, 61, 64, 66, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30 (100)	0.6-1.2 (2-4)	2 4	9+ 9	S2 S2	4	1	S	1,3,4,5 6,7,8,9, 10,17,20, 21,23,28

Tabebuia rosea **(H)** **Family:- *Bignoniaceae***

(Syn. *T. pentaphylla*)

(APAMATE)

Description: Sapwood yellowish-white when freshly cut, turning light brown on exposure. Golden to dark brown heartwood not always well differentiated from the sapwood. Fine brown lines of parenchyma produce a distinct figure on quarter-sawn surfaces. Lustre medium. Grain straight to interlocked. Texture medium to somewhat coarse. Odour and taste not distinct when dry. Trunk frequently fluted or irregular. Boles clear for 6 to 11m (20-36 feet) above the buttresses, which often extend 2 to 3m (7-10 feet) up the stem. Species found from wet lowlands to dry montane forests; may occur in pure stands, as isolated trees, or in mixed formations. Often planted for shade and ornamental purposes.

Characteristics: Timber air-seasons moderately fast with a little surface checking and slight warping. Kiln-dries with little degrade. Stock has excellent working properties. Can be sawn, shaped, bored and turned with very good results. In planing, care should be taken to prevent torn or chipped grain. Sharp and clean edges readily obtained. Finishes smoothly. Stains well and takes a high polish. Glues easily. Nails and screws well, but preboring necessary to prevent splitting. Steam bending properties poor to good. Stock can be sliced but requires careful plasticising beforehand. Very susceptible to termite attack. Weathering characteristics rated only fair. Moisture movement small.

References: 1, 2, 20, 21, 38, 61.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrinkage	Durability	Lyctus Suscep.	
12-18 (40-60)	0.5-0.6 (1½-2)	9 15,26	7+ 7+	S5 S5	3	1-2	S	1,2,3,4, 6,7,8,9,10,11,12,15,17,20,22

Tabebuia serratifolia (H) **Family:-** ***Bignoniaceae***

(TABEBUIA)

Description: Sapwood 30 to 90mm (1¼-3½ inches) wide, sharply differentiated from the heartwood, and yellowish-grey or greyish-brown coloured. Heartwood light to dark olive-brown, often with lighter or darker streaks. Lustre low to medium. Grain straight to interlocked or irregular. Texture fine to medium, uniform. Wood has an oily feel. Growth rings distinct but not sharply defined. Pores contain a characteristic yellow-green deposit (Lapachol) which turns deep red in presence of alkaline solutions. Bole clear of branches up to 18m (60 feet) in length, straight, cylindrical and either unbuttressed or with low buttresses. Species found on a variety of sites from the tops and sides of ridges to river banks and low ridges in the rain forests. Grows in small groups, often in almost pure stands.

Characteristics: Timber is extremely heavy, exceptionally tough, strong and hard. Easy to season, drying rapidly with slight warping, checking and case hardening. A slower drying rate would minimize degrade. Moderately difficult to work, especially with hand tools, because of its density. Ripsaws may over-heat when cutting thick material, and teeth of crosscut saws tend to vibrate or chatter. Charring may occur in boring. In planing, a reduction in cutting angle to 15° recommended to avoid chipping in quarter-sawn stock. Finishes smoothly unless interlocked grain present. Stains and polishes well, requiring little filler. Pre-boring essential for nailing and screwing. Very resistant to termite but liable to marine borer attack. Heartwood impermeable to preservatives, sapwood treatable. Very stable. Sawdust may cause dermatitis.

References: 1, 13, 20, 21, 38, 44, 49, 50, 52, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-38 (100-125)	0.6-0.9 (2-3)	9 1,12	10 10+	S1 S1	5	1	S	1,2,3,4, 5,6,7,8, 9,10,11, 12,20,21, 23,28

Tapirira guianensis (H) **Family:- *Anacardiaceae***

(TAPIRIRI, FRESNO)

Description: Sapwood lighter in colour than the heartwood which is uniform pale pink to golden-brown, often stained by oily exudations. Fairly lustrous. Texture medium to fine, uniform. Grain generally straight. Growth rings present, but inconspicuous. Bole straight, unbuttressed and unbranched up to 12m (40 feet) in height. Found in savanna and gallery forests.

Characteristics: Timber is easy to season, drying rapidly with no seasoning degrade. Dark stain on surfaces may result from gum exudations. Works easily with all hand and machine tools. Planes easily and finishes smoothly. Turns and bores satisfactorily. Nails and screws well, with good holding powers. Polishes well. Sapwood very susceptible to blue stain. Prone to insect attack. Slices and peels satisfactorily.

References: 1, 20, 21, 33, 79, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23 (75)	0.3 (1)	8 9 1	6+ 7 8	S6 S6 S5	3-4	4	(S)	2,8,12, 15,17,18, 20,22,28

Tectona grandis (H) Family:- *Verbenaceae*

(TEAK) (EXOTIC)

Description: Sapwood 25 to 50mm (1-2 inches) wide, white to pale yellow and distinct from the heartwood which is a dark or golden-brown, darkening to almost black on exposure. Heartwood sometimes figured with dark markings. Grain variable depending on origin of strain. Native stock from India tends to be more irregular and coarse in texture. Plantation grown teak usually straight grained and of uniform fine texture. Surface oily. Strong fragrant odour present when freshly cut. Growth rings distinct. Trees vary in size and form according to locality, soil and climatic conditions. At their best, straight and clear bole lengths of 9 to 11m (30-36 feet) may be obtained. Species tolerant to a wide range of climates but requires a deep, well-drained, loamy soil. In Venezuela, an 8 year-old experimental plantation showed a mean height of 21m (70 feet).

Characteristics: Timber is easily air-seasoned or kiln-dried, with no appreciable defects, but drying rates between individual pieces vary considerably. Works easily with both hand and machine tools. The dulling effect on cutting edges can be overcome by using specially tipped tools. Power feeding of material and reduced cutting speeds are recommended. Very smooth finish obtained when tools are kept sharp, but care required to prevent roughness on end grain due to inherent brittleness. Takes and holds nails and screws fairly well. Glues satisfactorily when surface is freshly machined or sanded. Varnishes, polishes and waxes well. Liable to pinhole borer attack. Except for very young material, resistant to termites and marine borers. Heartwood extremely resistant to impregnation, sapwood permeable. Weathering properties excellent. Moderately good bending qualities. Good peeler. Resistant to a wide range of chemical reagents. High stability. May cause dermatitis.

References: 2, 5, 8, 10, 11, 14, 18, 19, 34, 36, 38, 43, 45, 64, 66, 76, 77, 96, 104, 116, 117, 142.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
40-45 (130-150)	1.2-1.5 (4-5)	47 (Native)	8	S4	1-2	2	S	1,3,4,5, 6,7,8,10,
		33,19	7+	S4				12,14,17,
		34,48	8+	S3				20,23,24,
		15,20	8	S5				25,26,27, 28,30,31

Terminalia amazonia (H) **Family:- *Combretaceae***

(NARGUSTA)

Description: Sapwood yellowish, merging gradually into the yellowish, light yellowish-brown or brownish-olive heartwood, often with irregular red-brown streaks. Lustre medium to rather high. Texture medium. Grain normally interlocked. Irregularities in the grain produce a stripe or wavy figure on quarter-sawn boards. Growth rings usually not well defined. No distinct odour or taste evident in seasoned material. Bole cylindrical, buttressed, and 15 to 18m (50-60 feet) in length. Species found in rain forests, and flat lands. Moderately fast-growing.

Characteristics: Logs left in the forest for any length of time are liable to pinhole borer attack. Also subject to end splitting due to internal stresses, particularly if stored in warm weather. Timber needs care in seasoning. Both air- and kiln-drying rates are slow. Little tendency to warp but marked end-splitting and surface checking may occur. Hard to work with machine and hand tools. Moderate dulling effect on saw teeth. Straight grained stock planes, moulds, bores, mortises and saws cleanly. Raised grain may occur in planing with interlocked material, for which a knife angle of 10° and saws with 54 teeth and 15° hook are recommended. Turns very well. Glues, stains and polishes satisfactorily. In nailing, pre-boring necessary to prevent splitting. Rated poor to fair for steam bending and only fair in resistance to weathering. Timber resistant to termites but susceptible to marine borers. Sapwood moderately resistant, heartwood extremely resistant to impregnation with preservatives. Difficult to cut into veneer. Moisture movement moderate. Bark used for tanning.

References: 1, 13, 27, 34, 35, 38, 46, 47, 55, 87.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
21-42 (70-140)	1.2-1.5 (4-5)	11,26 15,25 9	9 8+ 9	S3 S3 S1	4	2	S	1,2,3,4,5, 6,7,8,12, 17,20,21,23,28

Triplaris surinamensis (H) **Family:- *Polygonaceae***

(MIERENHOUT)

Description: Sapwood and heartwood not differentiated. Wood pale grey-brown to pinkish-brown in colour. Lustrous. Texture moderately coarse. Grain straight or slightly interlocked. Bole 15 to 18m (50-60 feet) long, flattened or fluted, with low narrow buttresses. Found in lowlands, in old clearings - sometimes in almost pure stands - and on low river banks. Also occurs in swamp and rain forests. Regenerates easily after forest fires.

Characteristics: Timber moderately difficult to season; should be handled carefully. Works easily and finishes smoothly. Takes a good polish. Splits easily. Pre-boring advisable in nailing. Susceptible to termite and marine borer attack. Wood permeable to preservative treatment. Moisture movement rather low to moderate. Produces a good quality fibreboard.

References: 1, 44, 49, 50, 66, 87, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-36 (90-120)	0.5 (1½)	12 9	7+ 6+	S4 S6	3-4	4	(S)	2,8,15, 17,20,22, 25,30

Virola melinonii (H) Family:- *Myristicaceae*

(HILL DALLI)

Description: Sapwood and heartwood not demarcated. Wood is light brown with darker areas, sometimes dull white. Lustre high. Texture medium. Grain straight to slightly interlocked. Growth rings indistinct. Ray flecks conspicuous on quarter-cut surfaces. Clear bole may be up to 23m (75 feet) long. Common in mixed hardwood forests.

Characteristics: Special precautions needed to prevent staining and decay during logging and drying operations. Timber air-seasons rapidly with moderate warping but slight casehardening and possibility of surface and end checking. A medium rate of kiln-drying reduces degrade. Wood soft and easily worked. Sawn and bored surfaces frequently woolly, but smooth surfaces obtained in planing. Nailing, screwing and gluing properties very good. Light-coloured material readily adapted to treatment with transparent finishes. Potentially good qualities for plywood manufacture.

References: 44, 81, 83, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
33 (110)	0.6 (2)	12	7	S6	5	4	S	8,12,15, 17,19,20, 22,26,31

Virola oleifera (H) **Family:- *Myristicaceae***

(BICUIBA)

Description: Sapwood not distinct from the heartwood, which is dark brown when freshly cut, turning to a light pinkish-brown on exposure. Growth rings not usually distinct. Texture medium to fine. Grain fairly straight. Lustre low. No figure. Odour and taste not distinct. Bole usually straight, cylindrical and may be up to 21m (70 feet) in length. Found mainly in coastal rain forests usually on wet, sandy-clay soils, rich in humus. Prefers altitudes around 800 to 1000m (2600-3300 feet).

Characteristics: Rapid extraction and conversion of logs followed by dipping immediately after sawing essential to prevent losses due to fungi and insect attack. Care must be taken in seasoning because of tendency to warp and check and occasionally collapse. Planes to a smooth finish, carves and mortises well. Takes nails and screws easily without splitting, and has good holding power. Glues, polishes and varnishes well. Turns satisfactorily. A good peeling timber. Reported to be very susceptible to *Anobium*, termite and pinhole borer attack. Heartwood and sapwood permeable to preservative treatment.

References: 7, 8, 16, 24, 25, 112.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27 (90)	0.6-0.9 (2-3)	1	7	(S6)	4-5	4	S	2,4,8,12, 13,15,17, 18,20,27, 28,31

Virola sebifera (H)

Family:- *Myristicaceae*

(CUMALA, VIROLA)

Description: Sapwood pale golden to pale rose-brown, merging gradually into the uniform light reddish, greyish or brown heartwood. Sapwood and heartwood sometimes not demarcated. Lustre medium to high. Grain straight and irregular. Texture medium and uniform. Odour and taste not distinct. Bole clear for upwards of 23m (75 feet). Grows principally in secondary forests.

Characteristics: Prophylactic treatment during logging operations recommended to prevent degrade due to stain, fungi and insects. Timber air-seasons moderately well, although rapid drying may cause collapse. Can be kiln-dried satisfactorily. Works easily with ordinary tools and finishes well. Fuzzing and tearing likely to occur if tension wood present. Nails and screws easily without splitting; fair holding capacity. Can be stained, varnished and polished with good results. Turns satisfactorily. Glues readily. Very susceptible to termite and pinhole borer attack. Permeable to preservative treatment. Suitable for the manufacture of toothpicks.

References: 1, 5, 33, 41, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-30 (90-100)	1.2 (4)	8	7+	S4	3	4	S	8,12,15, 17,19,20, 22,28,29, 30,31

Virola surinamensis (H) **Family - *Myristicaceae***

(Syn. *Myristica surinamensis*)

(BABOEN)

Description: Sapwood narrow and not clearly demarcated from the heartwood which is cream, light brownish to pinkish-grey when first cut, turning pinkish to deep reddish or golden-brown on exposure. Lustre medium. Texture medium to coarse. Grain straight. Growth rings not always distinct. No odour or taste. Boles usually straight, cylindrical and buttressed, 15 to 18m (50-60 feet) in length. Occurs in swamp and marshy forests.

Characteristics: Logs must be converted, stored under water, or sprayed with preservatives soon after felling to prevent degrade due to stain and pinhole borer attack. Timber kiln-dries easily with only slight warping and casehardening if a rapid schedule is applied. Cuts well with hand and power saws, and works easily with hand and machine tools. Turns satisfactorily and finishes well. Takes nails and screws easily without splitting. Glues readily. Timber stains, varnishes and polishes with good results. Takes a high lustrous finish. A first class peeling timber. Very susceptible to termite and marine borer attack. Sapwood and heartwood permeable to impregnation. Timber rather unstable. Seeds rich in oil: used for candles and soap making.

References: 1, 3, 5, 8, 15, 20, 35, 38, 44, 49, 50, 52, 61, 75, 87, 103, 123.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
30-36 (100-120)	0.6-0.9 (2-3)	1 9 11	6+ 6 6+	S6 S7 S7	4-5	4	S	8,12,15, 17,18,19, 20,22,23,26,29,30,31

Vochysia guianensis (H) **Family:- *Vochysiaceae***

(QUARUBA, KWARIE)

Description: Sapwood 40 to 75mm (1½-3 inches) wide, not always clearly differentiated, and pale yellow or grey in colour. Heartwood pale pink-brown darkening to golden-brown, often with stripes on radial surfaces. Lustre medium to high. Texture moderately coarse, even. Grain straight or interlocked, producing a ribbon figure. Open gum ducts with dark contents often present. Green timber reported to have a very high moisture content. Trees very variable in size, the tallest specimens being recorded in Honduras. Bole 15 to 21m (50-70 feet) long, straight, cylindrical and unbuttressed but with a swollen base. Commonly occurs in rain forests.

Characteristics: Timber may dry from a slow to rapid rate with occasional surface checking, collapse, case hardening and warping. Saws and works readily. Machines satisfactorily but tends to have a fibrous surface unless cutters are kept sharp. Glues well. Stains and paints satisfactorily. Polishes well after sanding and filling. Nails easily. Peels well. Pinhole borer damage occasionally present. Moderately resistant to termite attack but may present a low resistance to marine borer attack. Heartwood generally resistant to preservative treatment. Weathers well. Fair steam bending properties. Suitable for plywood manufacture. All properties vary widely with region of growth.

References: 8, 10, 14, 38, 43, 44, 76, 78, 82, 83.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
27-40 (90-130)	0.6-1 (2-3¼)	12 1	6+ 7	S6 S5	3-5	3-4	S	2,6,8,12, 15,17,18, 20,31

Vouacapoua americana (H) **Family:- *Papilionaceae***

(WACAPOU, ACAPU)

Description: Sapwood 20 to 30mm (¾-1¼ inches) wide, cream coloured and clearly demarcated from the dark brown or reddish-brown heartwood. Numerous fine parenchyma lines of light brown colour produce an attractive figure. Moderately lustrous. Texture uniformly coarse. Grain straight, sometimes slightly wavy. No distinct odour or taste. Bole 14 to 17m (46-55 feet) in length, slender and unbuttressed. Grows in upland rain forests, occupying the higher lands close to the rivers. Tends to grow gregariously in some areas.

Characteristics: Timber air-seasons moderately well at a medium rate with slight warping, end and surface checking, and case hardening. Only moderately difficult to work, despite its high density, and saws very well. Smooth surfaces can be obtained in sawing and planing, but coarse grain may cause some difficulty in boring and mortising. Turns well. Takes a good polish. Glues well. Difficult to nail when dry, preboring advisable. Resistant to termites and highly resistant to teredo attack. Heartwood very resistant to preservative treatment. Weathering characteristics very good. Stable in use. Suitable for high class furniture and cabinet work.

References: 1, 5, 7, 9, 17, 20, 38, 44, 52, 61, 103.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
23 (75)	0.6 (2)	12 1,13	9+ 9+	S2 S1	4	1	(N)	1,2,3,5, 6,7,8,20, 21,23

Warscewiczia coccinea (H) **Family: *Rubiaceae***

(WAKAMY)

Description: Sapwood usually not distinct from the heartwood which is cream-yellow to brownish with a pink or olive tinge. Moderately lustrous. Oily odour, but no distinct taste. Grain straight. Texture moderately fine. Greyish-white deposits sometimes present. Bole short, moderately straight and slender. Common throughout the lowlands in dry loam, in old clearings, and frequently in the uplands along wooded slopes.

Characteristics: Timber seasons fairly well but with a tendency to check. Saws and machines easily, yielding good surfaces. Planes easily and finishes smoothly with little sanding. Takes nails and screws well but with a slight tendency to split. Liable to blue stain and probably not resistant to insect attack. Timber tends to be splintery.

References: 1, 33, 79.

TREE		PROPERTIES						USES
Height m (ft)	Diam. m (ft)	Origin of Data	Density	Strength Group	Shrink-age	Dura-bility	Lyctus Suscep.	
15 (50)	0.3 (1)	8	8	S3	3-4	3-4	(S)	2,8,12, 17,20,28

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