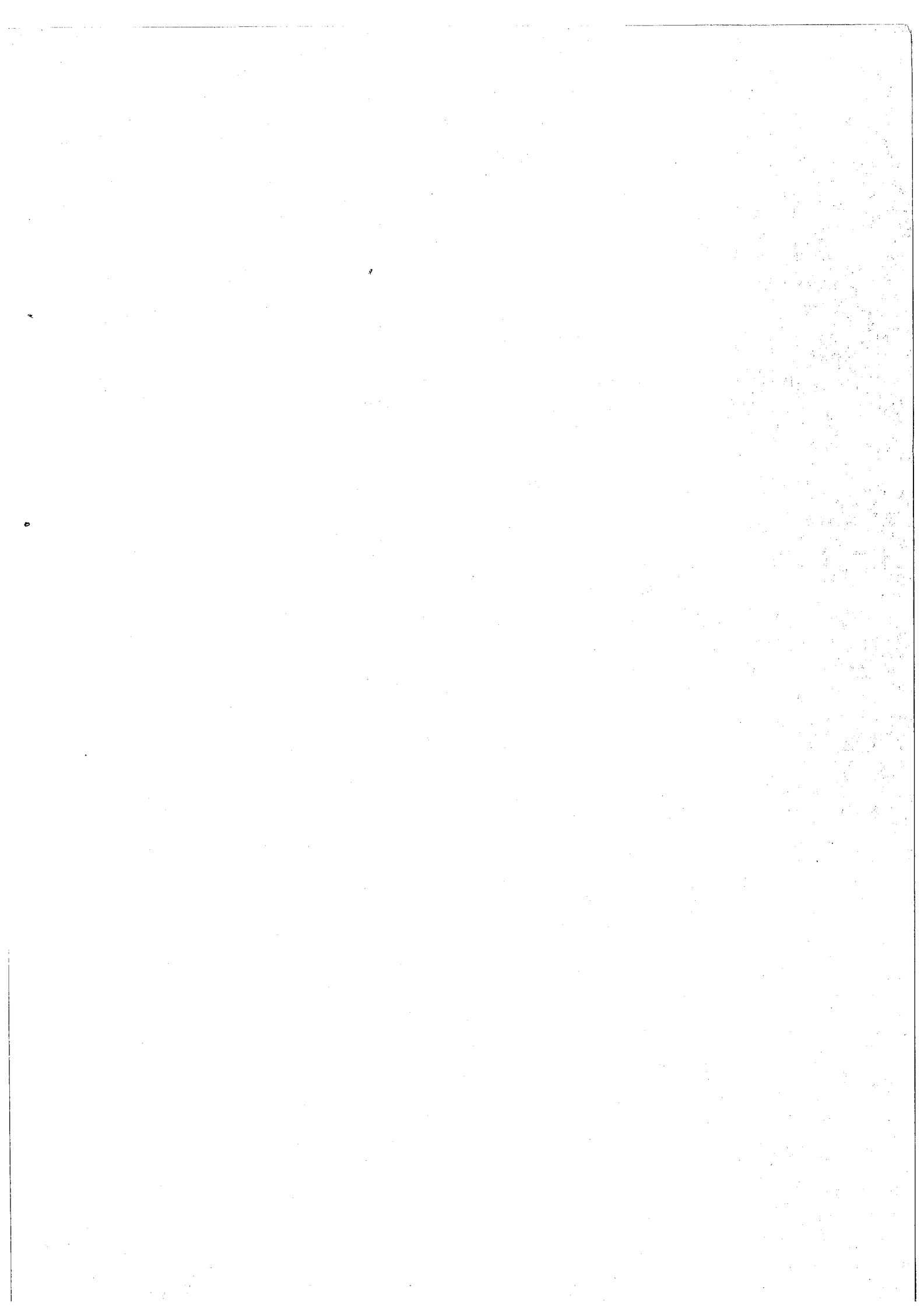
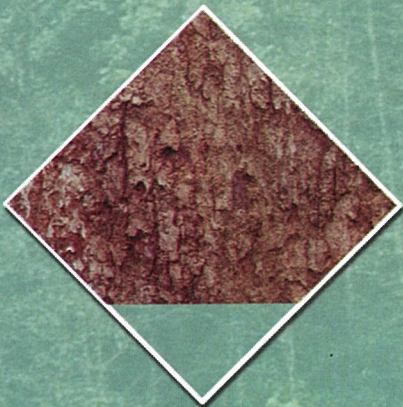
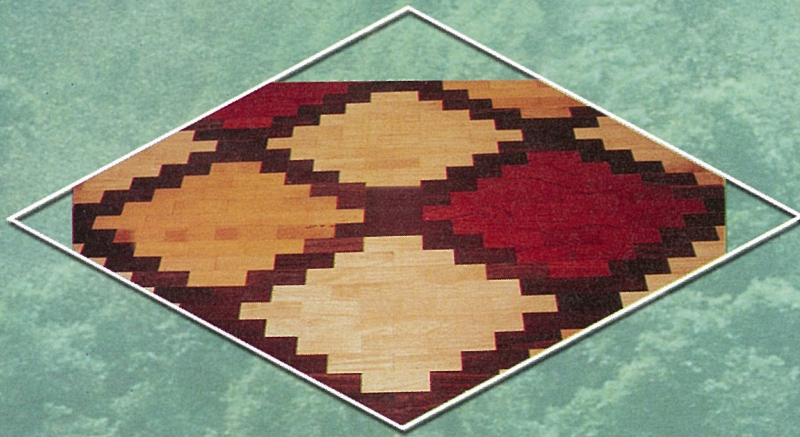
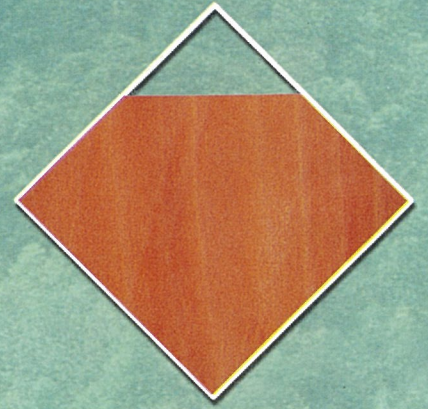
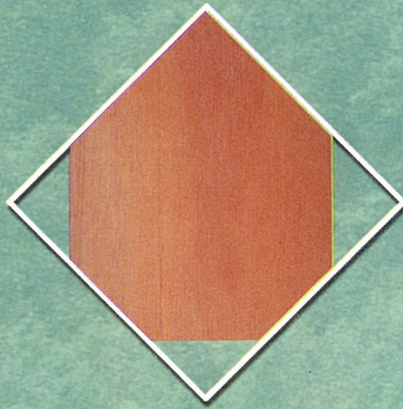
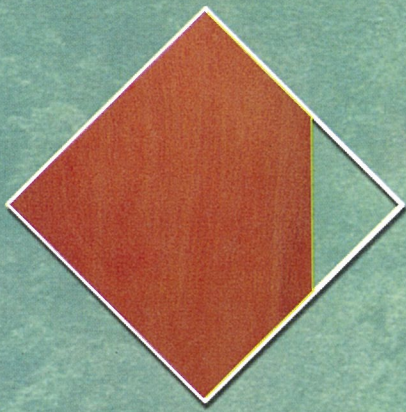
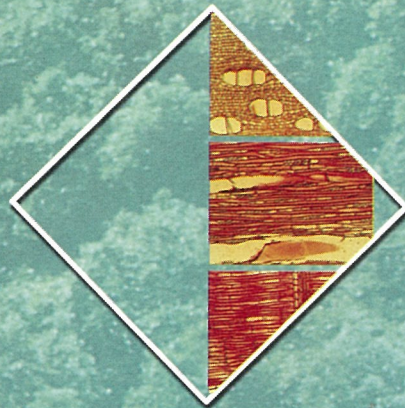
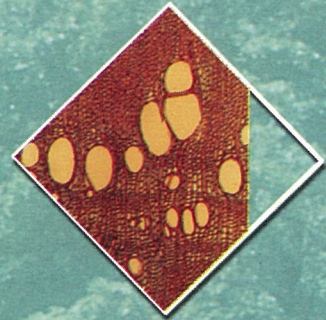
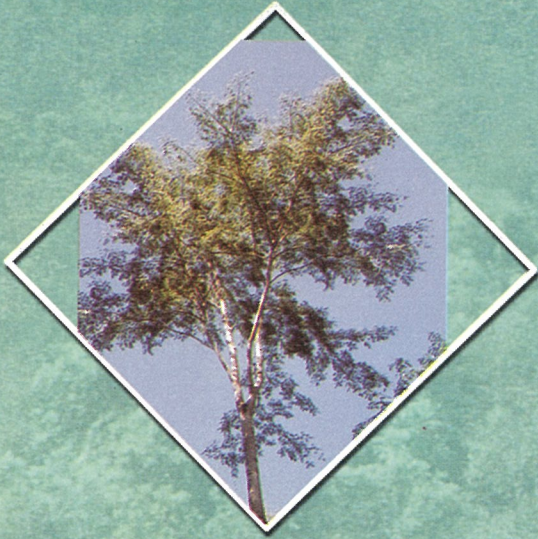
An aerial photograph of a dense, lush green forest covering a hillside. The trees are tightly packed, creating a textured, undulating surface of green. The lighting is even, highlighting the vibrant colors of the foliage.

Handbook of Lesser Used Timber Species in Myanmar







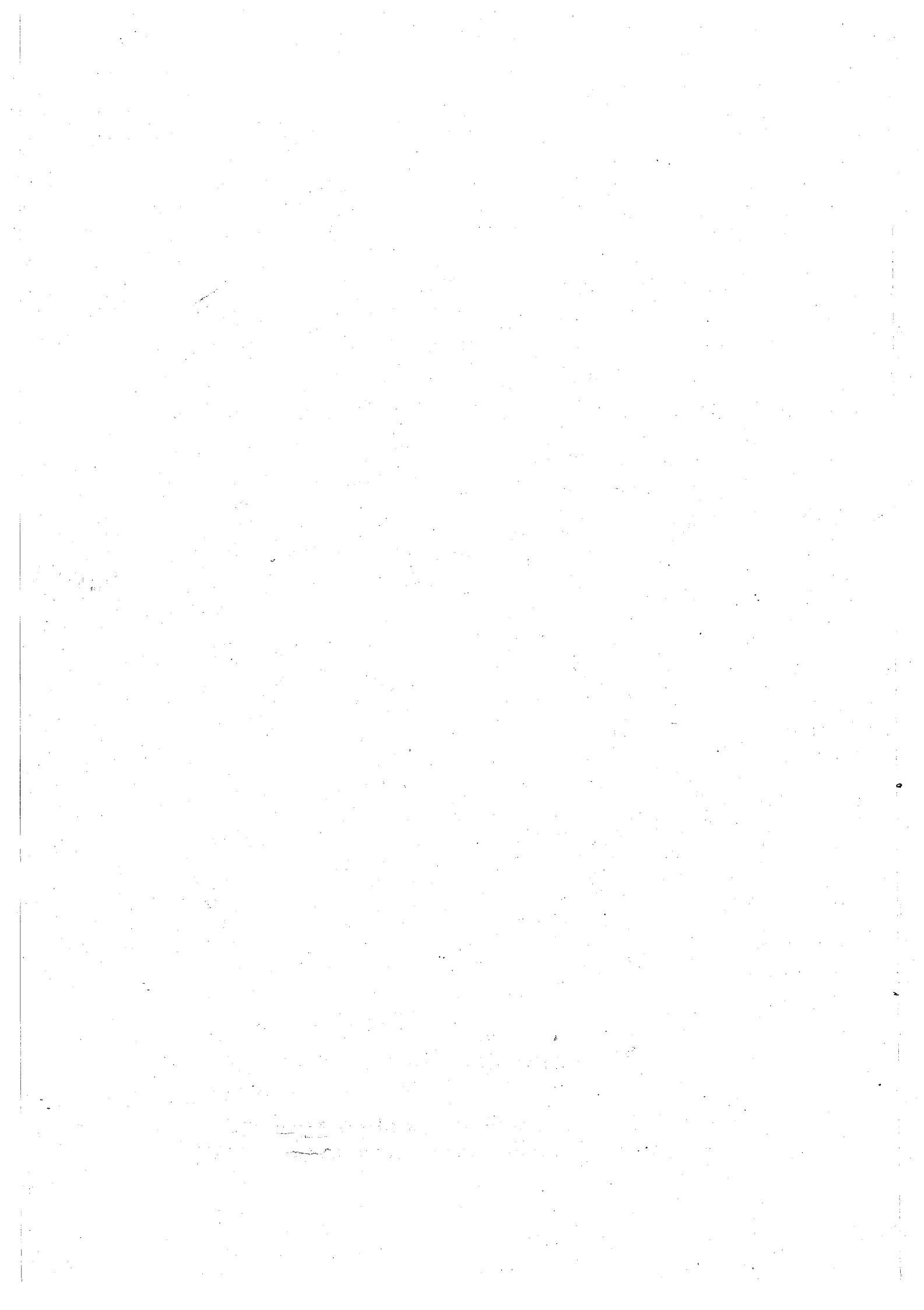


Handbook of Lesser Used Timber Species in Myanmar

Published by

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International Tropical Timber Organization (ITTO)

First Edition 2000





“LAWKANAT” Curving Sign of Peace

THE UNIVERSITY OF CHICAGO

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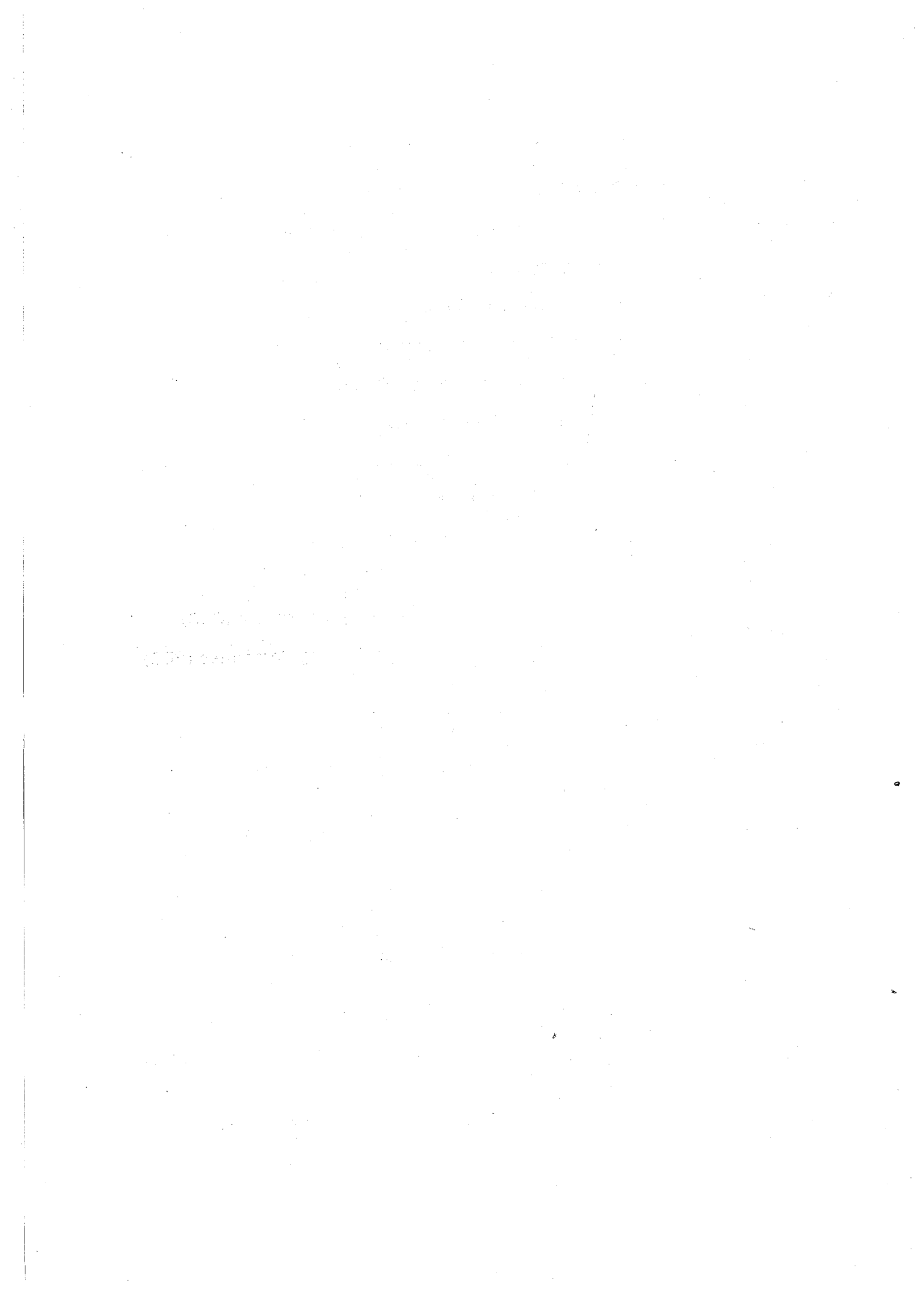
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PREFACE

Annual tropical wood production from producer members of International Tropical Timber Organization (ITTO) in the mid 1990s was around 172 million m³, constituting about 11.5 per cent of the global wood production. Statistics indicated that only 11 per cent of the international trade worth USD 150 billion annually, was accounted for by tropical forest products. Despite these small shares in the scales of global wood production and value, supply of traditionally high-valued or wider-used tree species from the tropics has been witnessed in a declining trend while global demand for wood is increasing. Heavy reliance on limited number of selected tropical timber species for continuous wood production is considered as the major cause. The need for increased production of additional tropical timber species, which are in generic term accepted as lesser-used species (LUS), has become one of the reactive options and much effort has been generated.

In this regard, many ITTO producer members have been engaged in promoting LUS utilization, and many LUS have found their way to markets both domestic and export, although many issues still remain to resolve. For instance, Papua New Guinea timber species now being exported, were all classed as LUS in the mid 1970s.

Increased LUS utilization could possibly be enhanced further with the advancement in new technologies, such as composite products, non-destructive evaluation, mechanical grading system and engineered wood products. These technologies allow the use of the changing wood resource with a more diverse raw material supply.

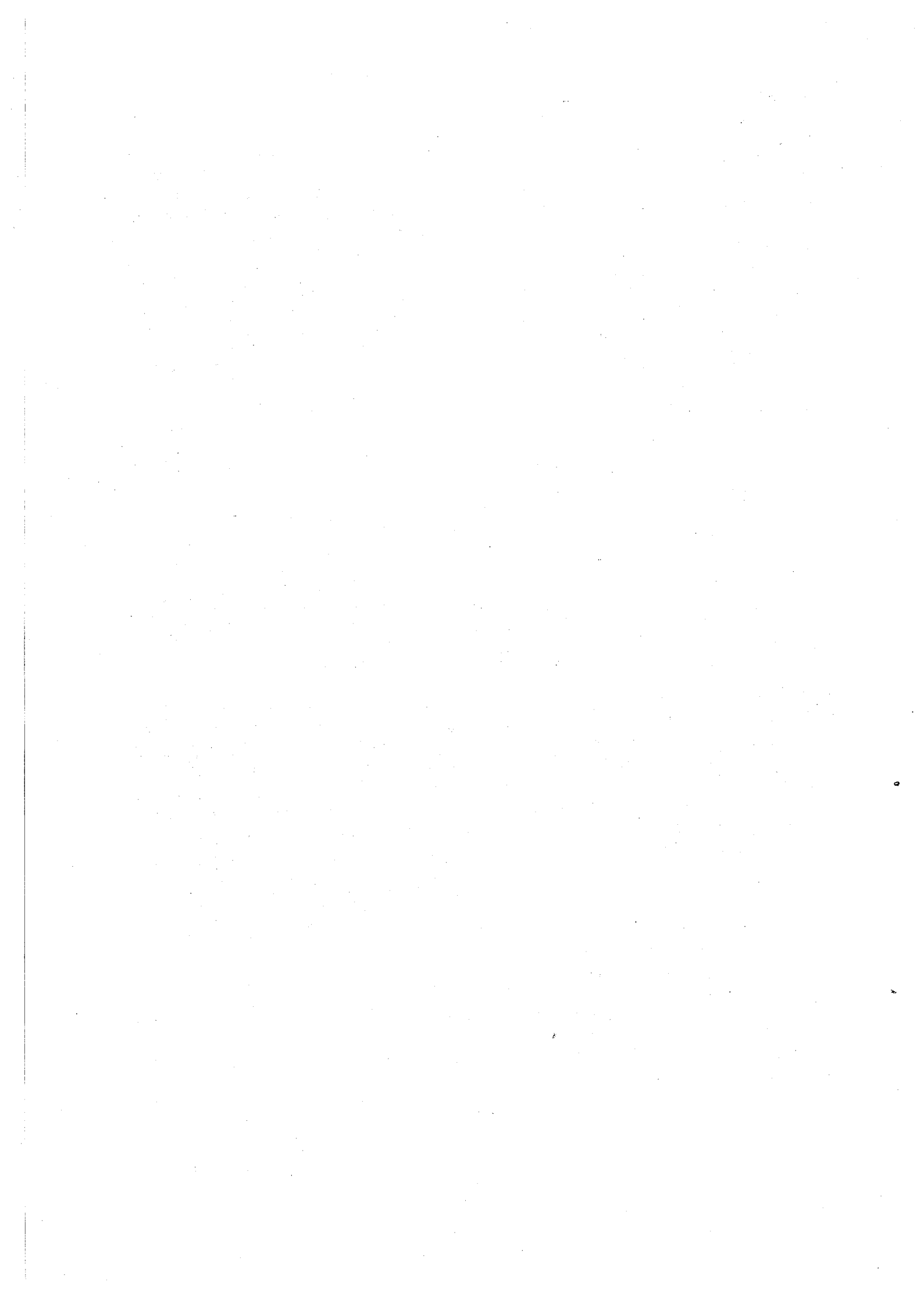
Despite such efforts and technology development, challenging uncertainties with respect to socio-economic and ecological implications, facing the LUS-based industry are yet to be resolved to ensure sustainable forest management (SFM).

Myanmar has a high potential for increased LUS harvesting and utilization. Policy, legislation and institutional framework are also in place for SFM. An ITTO Project, PD 31/96 Rev. 2 (M.FI), entitled "Introducing Myanmar's Lesser-Used Timber Species to the World Market", jointly undertaken by Myanmar and ITTO, has made many initiatives regarding the LUS and paved the way for further actions. Existing logging rules and guidelines, already in use and the recently adopted "National Code of Forest Harvesting Practices in Myanmar" will all strengthen the environmentally friendliness of increased LUS harvesting with minimal impacts on the environment.

This handbook is the most emphasized output of the ITTO Project, and scientific information on technical, aesthetical and biological properties of 54 selected LUS with relatively abundant supply is detailed in the handbook. Illustration of these 54 timber species in the form of prints with natural colour is also another attractive feature of this published material.

It is expected that this handbook would, at least in part, provide significant contribution to the promotion of LUS utilization and it is one step forward to fully attain SFM not only in Myanmar but also in those countries with similar forest eco-systems.

Dr. Kyaw Tint
Director-General
Forest Department



ACKNOWLEDGEMENT

During the implementation period of the project "Introducing Myanmar's Lesser Used Timber Species to the World Market", the ITTO Project PD 31/96 Rev.2 (M.F.I), tireless efforts have been provided by many administrative professional, and technical staff members of the Forest Department of the Union of Myanmar.

Great appreciations are indebted to those field staff who had their hard time in forest collecting data on LUS composition and distribution and thanks are also due to the staff of Planning and Statistics Division of the Forest Department for compilation of the forest inventory data.

Many more thanks are due to the staff of the Forest Research Institute who examined various properties of timbers mentioned in this handbook. Most of the information provided in this paper were investigated by the staff of the Forest Research Institute.

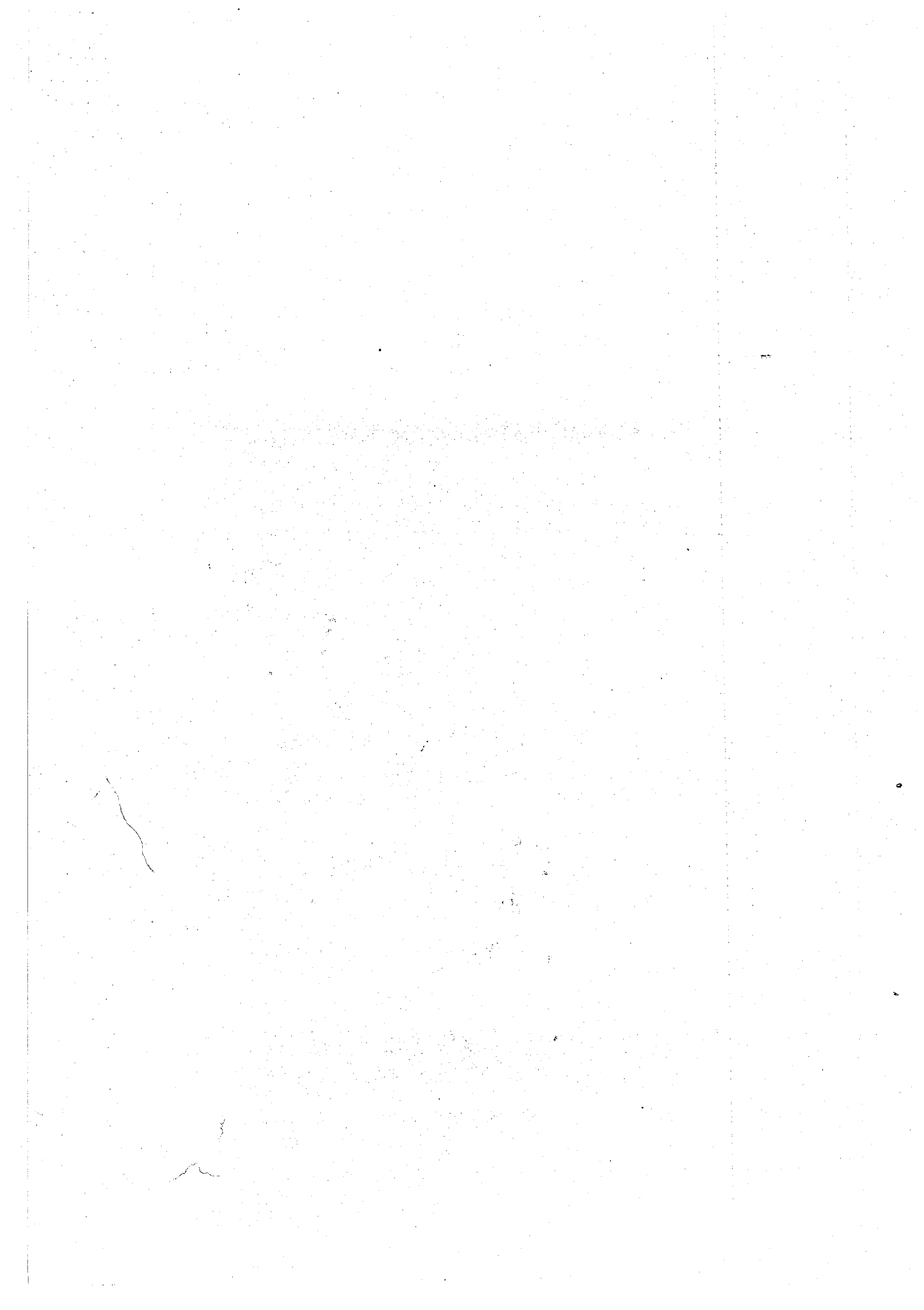
Heartfelt thanks are indebted to the personnel of the Secretariat of the project who devoted their time and efforts in accomplishment of the goal of the project.

Invaluable thanks are due to Dr. Kyaw Tint, the Director - General of the Forest Department with the assistance of U Shwe Kyaw, the Deputy Director - General who provided decisive guidance on successful implementation of the project through out the period.

It is a great honour to express appreciation and gratitude to His Excellency U Aung Phone, Minister, Ministry of Forestry and Chairman of the Project Steering Committee (PSC) who led the entire role of functioning successful implementation of the project.

Last, but not the least to be mentioned is Dr. Hwan-Ok Ma, the Projects Manager of the International Tropical Timber Organization who has supervised the project and provided continuous guidance. Without impressive collaboration of all members mentioned above the goal of the project would not be accomplished.

National Project Manager
ITTO Project PD 31/96 Rev.2 (M.F.I)



INTRODUCTION

What is LUS ?

The term LUS, Lesser-Used Timber Species, is the synonym of the former term known as LKS, Lesser-Known Timber Species, in the sector of timber trade and research. Although LUS and LKS are recognized worldwide, their specific identification is different from one place to another. Teak is apparently a well known timber species internationally so also is Oak, an important commercial species in other countries, but the latter is a LUS in Myanmar. Export data reveals that there have been more than 26 timber species exported during the period 1988-98. Total volume of timbers, from Teak, Pyinkado, Padauk, In and Kanyin species, exported during the above mentioned period covered 84.56 % and the earning reached 91.07 % out of the whole timber export trade. Survey conducted in domestic timber trade in Myanmar also showed that Teak is the major raw material for production of furniture and other appliances.

There are reasons why many timber species are being regarded as LUS. Scarcity of specific LUS both in the forest and in the market is the main reason. The standing volume of most abundant species such as Taukkyan (*Terminalia tomentosa*) is less than one half the volume of standing Teak trees at exploitable size. Standing volume composition of most LUS, by species-wise, is less than one percent of the total standing volume of trees at exploitable size.

Research results indicated that quality of many LUS are comparable or not inferior to those of some commercial timbers. However, dissemination of these findings to the public or users is not sufficient. Therefore, timber trade is relying on user-bias, the availability in the market and consistent supply of the well-known species.

It may, therefore, be concluded that LUS does not necessarily mean the quality but it is the result of many functions including availability, awareness, technology, investment, etc. This paper is designed to provide information on some LUS of Myanmar to both national and international researchers, entrepreneurs, scientists, scholars and interested readers.

Distribution of LUS by Area and Forest Types

The forest resources data (1981-99) revealed that there were more than 482 tree species in the forest of 9.55 million hectares covered by the forest inventory in parts of Myanmar. Out of these trees only 399 species attained the merchantable size of 0.58 m (6 feet gbh) diameter at breast height. Naturally, many species in a given area mean lesser number of stands for each species. Recorded data of

inventory indicated that majority of species get lesser share in composition. At 0.58 to 0.67 metre (6.0' to 6' 11" gbh) diameter at breast height, only 64 species occupy majority of tree composition i.e 84.7 %. Commercial species were, undoubtedly, included in this figure. Excluding the commercial species, not more than 50 species are left for consideration of LUS trade promotion. Thus majority of species should be left in the forest for conservation of biodiversity. The forest inventory (1981-89) covered seven states and division out of fourteen states and divisions in Myanmar as follows;

- (i) Sagaing division,
- (ii) Mandalay division,
- (iii) Yangon division,
- (iv) Magway division,
- (v) Bago division,
- (vi) Ayeyawady division, and
- (vii) Rakhine state.

Among these areas, forest of Sagaing division was found to be the richest in stand composition of majority of tree species. However, the following tree species at merchantable size were found to be rare in that state.

Dwabok	<i>Kydia calycina</i>
Dwani	<i>Eriolaena candollei</i>
Gwe	<i>Spondias pinnata</i>
Lein	<i>Terminalia pyrifolia</i>
Leza	<i>Lagerstroemia tomentosa</i>
Sit	<i>Albizia procera</i>
Taung-petwun	<i>Pterospermum acerifolium</i>
Thingadu	<i>Parashorea stellata</i>

Bago division followed second in richness of stand composition of tree species in the forest. The following species are represented as rare species in the division.

Gyo	<i>Schleichera oleosa</i>
Hmyaseik	<i>Antiaris toxicaria</i>
Hnaw	<i>Adina cordifolia</i>
Taukkyan	<i>Terminalia tomentosa</i>
Taung-meok	<i>Alstonia scholaris</i>
Taung-petwun	<i>Pterospermum acerifolium</i>
Taw-thayet	<i>Mangifera</i> spp.
Thabye	<i>Eugenia</i> spp.
Thadi	<i>Protium serratum</i>
Thit-swele	<i>Schrebera swietenoides</i>

Share of stand composition of tree species in other states and divisions was less than the Sagaing and Bago as mentioned above. However, there were exceptional cases of tree species composition in these areas. For instance, forest of Mandalay division has more tree species composition of the followings than the others.

Petthan	<i>Haplophragma adenophyllum</i>
Yinzat	<i>Dalbergia fusca</i>

Likewise, localised abundancy of tree species would be mentioned as follow:

Magway division

Lein	<i>Terminalia pyrifolia</i>
Letpan	<i>Salmalia malabarica</i>
Sit	<i>Albizzia procera</i>
Taung-petwun	<i>Pterospermum acerifolium</i>
Thit-payaung	<i>Nauclea sesslilifolia</i>
Yon	<i>Anogeissus acuminata</i>

Ayeyawaddy division

Taung-thayet	<i>Swintonia floribunda</i>
--------------	-----------------------------

Rakhine state

Taung-peinne	<i>Artocarpus chaplasha</i>
--------------	-----------------------------

Detailed composition of tree species by area is shown in Appendix (i)

Survival and flourishness of each tree species in an area depend on many geographical factors such as climate, topography, soil, latitude, etc. Myanmar is a country traversing from near equator to temperate region and has a long coastal belt along the bay of Bengal to Mergui Archipelago in the Indian Ocean. All of these factors direct the formation of different types of vegetation over the country including the forest types.

The forest department of Myanmar refers to the classification of Kermode (1964) for differentiation of forest types. This paper covers some 12 different types of forest (Appendix ii). It was found that most of the tree species mentioned in this paper confined to Moist Upper Mixed Deciduous Forest (MUMD) and Dry Upper Mixed Deciduous Forest (DUMD).

Apparently, the following tree species grow more in the Dry Upper Mixed Deciduous Forest.

Thit-payaung	<i>Nauclea sessilifolia</i>
Hnaw	<i>Adina cordifolia</i>
Myaukngo	<i>Duabanga grandiflora</i>
Sit	<i>Albizzia procera</i>
Thitkado	<i>Cedrela toona</i>
Kokko	<i>Albizzia lebbek</i>
Yinma	<i>Chukrasia tabularis</i>
Gwe	<i>Spondias pinnata</i>
Hmyaseik	<i>Antiaris toxicaria</i>
Lein	<i>Terminalia pyrifolia</i>
Taung-meok	<i>Alstonia scholaris</i>

Most tree species of LUS mentioned in this paper grow very well in Moist Upper Mixed Deciduous Forest (MUMD). In some cases, abundant growth of LUS could be found in the forests other than MUMD and DUMD as follows;

Taung-peinne	Giant Evergreen
Taung - petwun	Typical Evergreen
Thabye	Typical Evergreen
Thinkadu	Typical Evergreen

Detailed information of tree species by forest type is given in Appendix (ii).

Utilization of LUS and its Trade

Domestic market studies of the project indicated that 60 % of the furniture manufacturers used only Teak while the rest used both Teak and other hardwoods. Based on the information obtained from the survey, the following factors are considered responsible for lesser utilization of non-commercial timber species;

- LUS are not readily available in the market.
- Some LUS are reported to be difficult to work.
- Some LUS are not durable or not strong enough for construction purpose.
- Lack of awareness on the quality of LUS by the manufacturers and consumers.
- Lack of technology in processing of LUS at local manufacturers' level.
- User-bias stemmed from the strong traditional liking (Ethnic-taste) on some commercial timbers such as Teak, Pyinkado, etc.

In fact, reliance on Teak and Pyinkado by the consumers is mainly due to the fact that these timbers are very durable. The difference between these two timber is workability. While Teak is very easy to work Pyinkado is very hard to work. However, Pyinkado is much stronger than Teak. Among the LUS studied in this project Dwani, Gyo, Panga, Petthan, and Thit-magyi are also stronger than Teak. According to the Forest Resources Data (1981-89) overall composition of these trees at exploitable size is about 21 % of the composition of Teak at the same size. Therefore, it is obvious that availability of specific timber in large quantity is one of the major requirements for LUS. to become commercial timber.

Research Methodology of Wood Properties

The Lesser-used Timber Species (LUS) presented in this handbook had been collected from Phyukun and Kabaung Reserved Forests in Taungoo Forest District from 1997 to 1999 period under the project , "Introducing Myanmar's Lesser-used Timber Species to the World Market," the ITTO Project PD 31/96 Rev.2 (M.F.I). Authentication of plant species and wood specimens were confirmed by the herbarium and wood anatomy section, Forest Research Institute, Yezin. Information on properties of LUS were obtained from the research results carried out in wood utilization division of the same institute.

Descriptions

For the purpose of convenient study of LUS in Myanmar this handbook provides the readers of two pages of short notes and photographs for each species. Detailed descriptions of the LUS are shown in the appendices.

For the convenience of the readers the descriptions LUS are given in the alphabetical order of, their standard names followed by botanical names. The families which they belong are also given. For each species the description is made in the order habit, general characteristics, microscopic characteristics, basic specific gravity, strength group, durability, treatability, seasoning, working properties and uses on the left pages. The right pages illustrate the photographs of each tree species, its bark, timber in natural colour and photomicrographs of each timber in transverse, tangential and radial longitudinal sections at x 75 magnification. Followings are the explanation on each sub-heading of the description.

Habit

A short note described the size and form of the tree. Photographs of the individual tree and its bark are shown on the opposite page.

General Characteristics

Features of each timber species such as colour of sapwood and heartwood, texture, grain, gloss, odour and taste which can be noticed at a glance are described.

Microscopic Characteristics

The microscopic characteristics reveal the anatomical structure of vessel, parenchyma, fibre and rays. The description is visualised by photomicrographs shown on the opposite page. Presence of tyloses or gum deposit is also mentioned in this note. Terminology of microscopic description is used according to Chattaway (1932) and Wheeler, Bass and Gasson (1989).

Basic Specific Gravity

It is the weight measurement of wood calculated by dividing oven-dry weight by green volume. Detailed information on physical properties is given in Appendix (v) and (vi). These values were determined following the procedure described in ASTM designation : D 143-52 (1965).

Appendix (vi) describes air-dry density and shrinkage of wood from green to oven-dry state. Air-dry density is obtained by dividing weight of wood samples by its volume at 12% moisture content.

Strength Group

For the purpose of easy reference the strength of timbers are grouped into five categories viz. A,B,C,D and E. Corresponding parameters are shown as follow:

Strength Group	MOR (N/mm ²)	MOE (N/ mm ²)
A	Greater than 103	greater than 14,700
B	86-103	11,500-14,700
C	61-85	92,00-11,499
D	47-60	7,400-9,199
E	less than 47	less than 7,400

Detailed strength values for each species are shown in Appendix (vi) which include static bending, compressive strength and hardness of timber specimens at 12% moisture content. For easy reference, strength group of LUS are shown in Appendix (vii), classification chart for strength group. The mechanical properties presented here were determined according to ASTM: D 143-52 (1965).

Durability

Two methods had been applied to determine the natural durability of timber viz. laboratory durability test and field graveyard test. The laboratory durability test used two wood decay fungi, namely;

Schizophyllum commune, and
Lentinus velutinus

Timber specimens were exposed to each wood decay fungi. Periodical assessment of weight lost of the test specimens were measured and calculated. The procedure was repeated for three times.

Performance of timber in the field is determined by using graveyard test in which species of all LUS measuring 50 x 50 x 450 mm were buried in the field research station No.(7), Letpankhon. Analysis on the results obtained from the two tests for natural durability of each timber specimen was made. The classified results of natural durability of each timber is shown in Appendix (viii).

Treatability

Treatability refers to the rate of absorption of preservative by each LUS specimens. The wood specimens are subjected to heating up to a temperature of 87 °C for 1 hour submerged in the open tank containing a mixture of creosote and diesel oil in the ratio 50:50 and then left it overnight to cool down to room temperature. According to the results obtained the treatability of timbers is classified as follows:

Treatability Classification

Group	Absorption (kg/ m ³)
Very easy	greater than 190
Easy	130-190
Average	96-130
Moderately difficult	66-95
Difficult	30-65
Very Difficult	Less than 30

Seasoning

Seasoning behaviour of LUS were developed from the results of air dry test.

For the purpose of air-drying, drying defects were observed carefully at the end of the tests. Four classes viz, very fast, fast, slow and very slow are classified according to the drying time obtained for each species.

Initial kiln drying schedules were proposed using the "Quick Drying Test". Drying defects obtained from each test were graded and initial kiln drying schedule for each species was developed. Based on these proposed kiln schedule, two to three test runs have been conducted in the steam kiln to get the optimum kiln drying schedule for each species. Six kiln drying schedules are given in Appendix (x) and one of these is recommended for each LUS.

Recommended kiln schedules were obtained from the test results using 25 mm thick board of LUS. Therefore, adjustment should be made for proper kiln seasoning of various thickness of board.

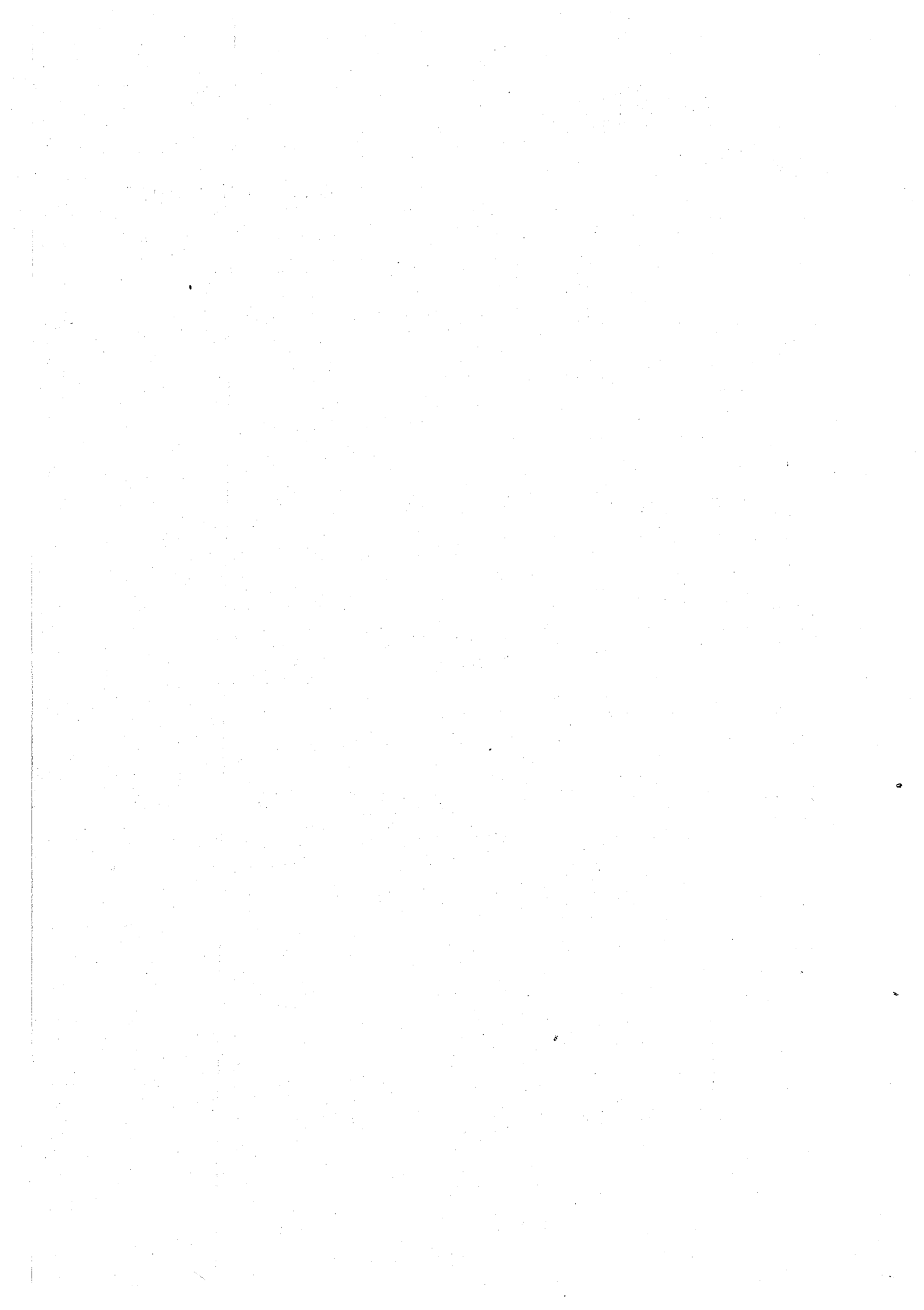
Working Properties

The working properties refer to the degree of difficulty in working the wood by machines or hand tools. The degree of difficulty in sawing, planing, boring, nailing, turning and mortising is classified into five categories viz., excellent, good, moderate, poor and very poor. The quality of finished products of LUS is also mentioned in some cases.

Recommended End-Uses

Utilization of timber in various purposes depends mostly on the quality of timber such as strength, density, movement, durability, etc. Most of the properties of timber depend on the density of wood. Generally, high density timber are more durable than lighter ones but the formers have higher movement and hard to work with hand tools and machines.

Medium density timbers get wider range of most indoor utility purposes such as furniture, panelling, flooring, doors and windows. Light density timbers get limited uses such as toys, packing box, match box, etc. Details of recommended end-uses are shown in Appendix (xii).



BAING

Tetrameles nudiflora R. Br.

FAMILY - Tetramelaceae

HABIT

A large tree reaching a height of 46 m, with trunk diameter of 0.4 to 0.8 m, long, straight, cylindrical stem with heavy buttresses at the base.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated, pale yellowish grey sapwood. Lustrous, irregularly interlocked-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 69% solitary, radial multiples of 2 – 3, 2 – 6 per mm², 113 – 308 (215) µm in diameter. Vessel length 328 – 564 (461) µm. Intervessel pitting 5 – 15 µm, alternate to opposite, vessel ray pitting 8 – 25 µm, opposite. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma very sparse. Rays 1 – 5 (mostly 3 – 4) cells wide, 2 – 37 cells high, 3 – 7 per mm, heterocellular, consisting of procumbent cells with one to three rows of upright cells on one or both sides.

BASIC SPECIFIC GRAVITY 0.38

STRENGTH GROUP E

DURABILITY - Non-durable

TREATABILITY - Very easy

SEASONING - Seasons well with almost no degrade.

Recommended Kiln Schedule:
- B (Proposed)

WORKING PROPERTIES

Works easily and saws very well, planing and nailing moderately good, boring satisfactory, a poor turnery wood, mortising also very poor.

RECOMMENDED END USES

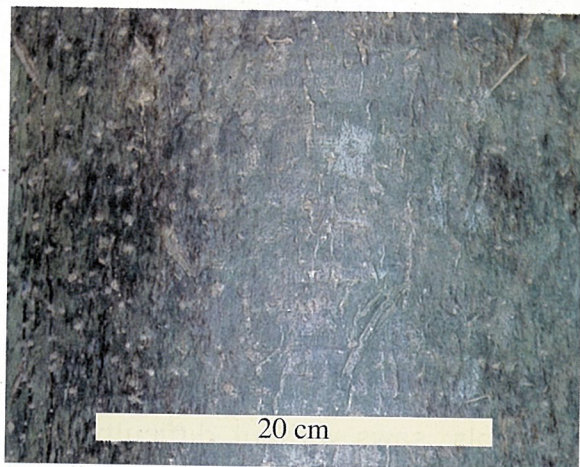
Packing box, match box, toys.



Timber specimen



A plant in natural habit

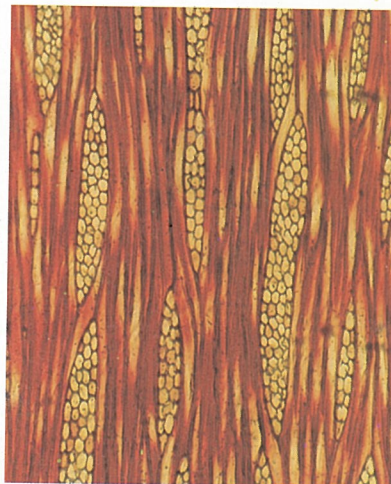


Bark

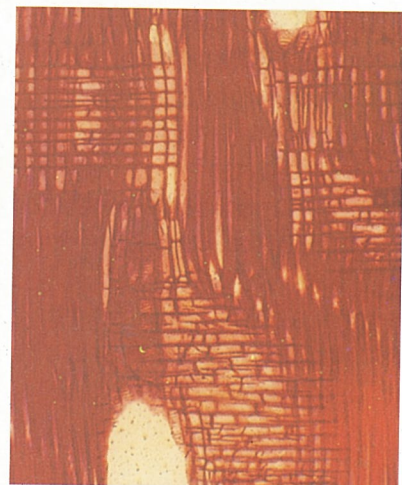
Baing
Tetrameles nudiflora R. Br.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

BINGA

Mitragyna rotundifolia (Roxb.) Ktze.

FAMILY - Rubiaceae

HABIT

A large tree reaching a height of 27m with trunk diameter of 0.5 to 0.9 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood yellowish brown to whitish yellow colour, not sharply demarcated from sapwood. Dull, straight-grained but sometimes irregularly wavy-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 75% solitary, radial multiples of 2 – 3, 20 – 37 per mm², 41 – 123 (71) μm in diameter. Vessel length 287– 1025 (545) μm . Intervessel pitting 3 – 5 μm , alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma scanty, diffuse and diffuse in aggregate. Rays 1 – 4 (mostly 2) cells wide, 2 – 41 cells high, 8 – 15 per mm, heterocellular, consisting of procumbent cells with one to ten rows of upright cells among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.55

STRENGTH GROUP D

DURABILITY - Moderately durable

TREATABILITY - Easy

SEASONING - Seasons slowly and care is needed to avoid split.

Recommended Kiln Schedule: D

WORKING PROPERTIES

Machines well, easy to work with all tools, saws without difficulty and planes excellent, easy to become a smooth surface; nailing and boring moderate; a good turnery wood; mortising well.

RECOMMENDED END USES

Furniture, turnery, chisel handles, house building, panelling, interior finish, door and window frames.



Timber specimen



Bark



A plant in natural habit

Binga

Mitragyna rotundifolia (Roxb.) Ktze.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

BONMEZA

Albizzia chinensis (Osbeck.) Merr.

FAMILY - Mimosaceae

HABIT

A large tree reaching a height of 36 m, with trunk diameter of 0.7 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood light brown or whitish brown to pinkish brown, sharply demarcated from white sapwood. Lustrous, straight-grained but irregularly interlocked-grained, texture medium, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 52% solitary, radial multiples of 2 – 4, 1 – 5 per mm², 21 – 267 (132) µm in diameter. Some vessel pores contain gum deposits. Vessel length 195 – 809 (395) µm. Intervessel pitting 3 – 6 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, non-septate, with very sparse, minute slit-like pits in radial walls. Axial parenchyma vasicentric, aliform, aliform confluent and diffuse. Prismatic crystals in 2 to 8 chambered axial parenchyma. Rays 1 – 3 (mostly 1) cells wide, 3 – 17 cells high, 9 – 17 per mm, homocellular, consisting of only procumbent cells. Some ray parenchyma contain gum deposits.

BASIC SPECIFIC GRAVITY 0.29

STRENGTH GROUP E

DURABILITY - Non-durable

TREATABILITY - Difficult

SEASONING - Seasons very fast with almost no degrade.

Recommended Kiln Schedule:
- B (Proposed)

WORKING PROPERTIES

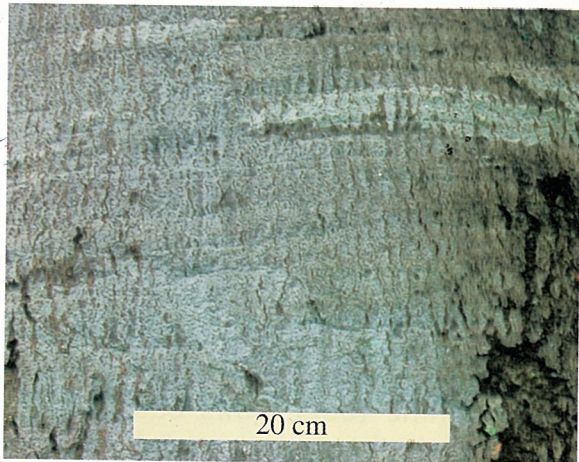
Saws easily and works well with hand and machine tools, but cut surfaces tend to be woolly, easily to nail and boring well; turning and mortising satisfactory.

RECOMMENDED END USES

Household appliances, musical instruments, turnery wood, packing box, match box.



Timber specimen

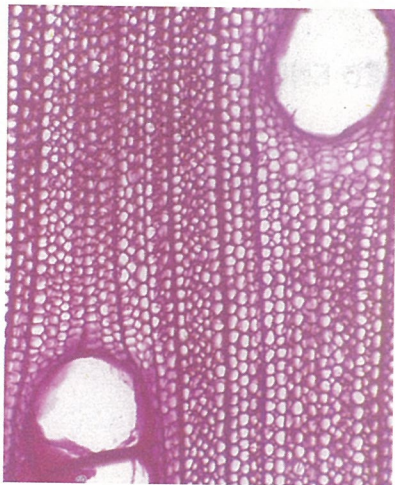


Bark

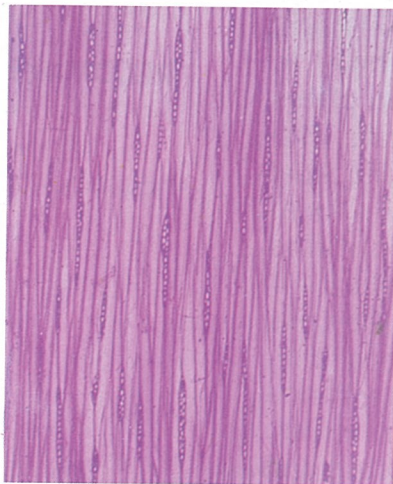


A plant in natural habit

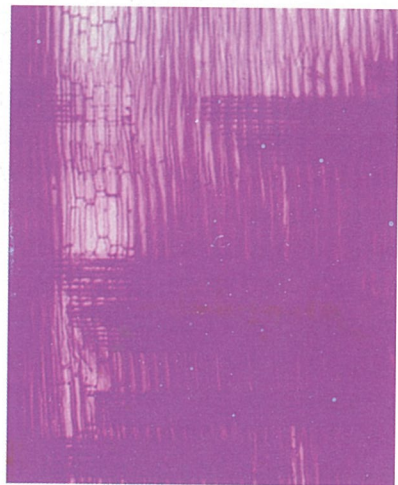
Bonmeza
Albizia chinensis (Osbeck.) Merr.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

CHINYOK

Garuga pinnata Roxb.

FAMILY- Burseraceae

HABIT

A large tree reaching a height of 33 m with trunk diameter of 0.6 to 0.9 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood reddish brown, sharply demarcated from white sapwood. Slightly lustrous, interlocked-grained, texture coarse and uneven, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 71% solitary, radial multiples of 2 – 12, 5 – 27 per mm², 72 – 318 (203) µm in diameter. Vessel pores contain tyloses and gum deposits. Vessel length 256 – 799 (346) µm. Intervessel pitting 8 – 12 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma very sparse. Axial parenchyma sometimes contains crystals and gum deposits. Rays 1 – 4 (mostly 3 – 4) cells wide, 1 – 25 cells high, 5 – 10 per mm, heterocellular, consisting of procumbent cells with one row of upright cells on one or both sides. Ray parenchyma consist of crystals and gum deposits.

BASIC SPECIFIC GRAVITY 0.60

STRENGTH GROUP D

DURABILITY - Moderately durable

TREATABILITY - Moderately difficult

SEASONING - Seasons very slowly with no degrade.

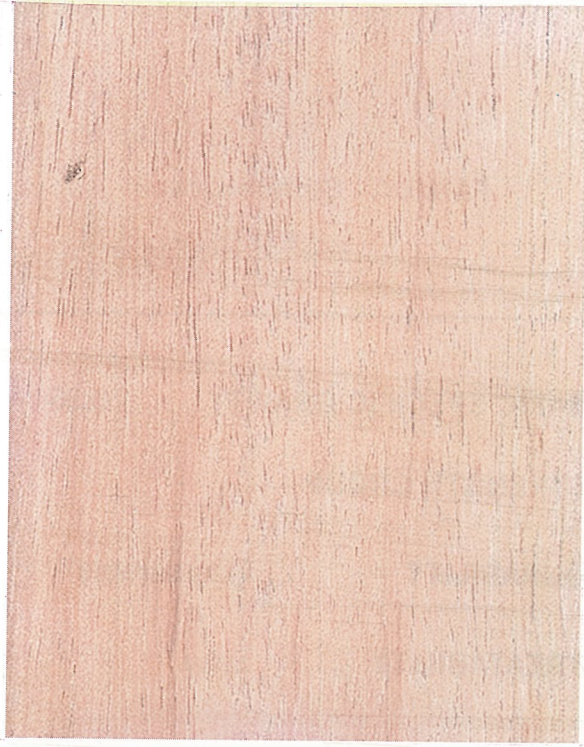
Recommended Kiln Schedule: F

WORKING PROPERTIES

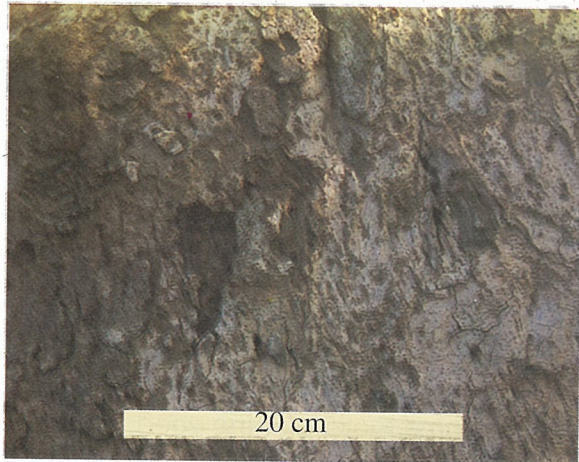
Works very well with hand, saw and machine tools, nails easily and moderately boring, good turning properties; mortising well.

RECOMMENDED END USES

Packing box, match box, drums, house building, musical instruments.



Timber specimen



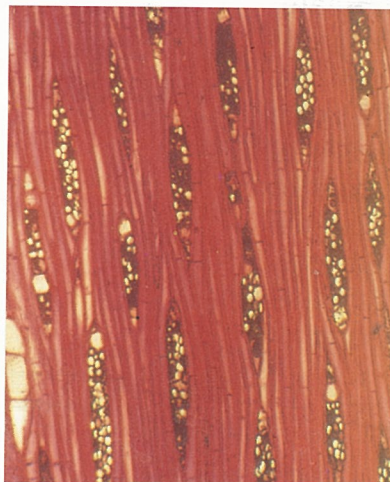
Bark



A plant in natural habit
Chinyok
Garuga pinnata Roxb.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

DIDU

Salmalia insignis Schott. & Endl.

FAMILY - Bombacaceae

HABIT

A large tree reaching a height of 48 m, with trunk diameter of 0.6 to 1.0 m, long, straight, cylindrical stem with buttress.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from white to pale yellowish brown sapwood. Dull, straight-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 88% solitary, radial multiples of 2 – 3, 0 – 5 per mm², 174 – 379 (258) µm in diameter. Vessel length 410 – 543 (462) µm. Intervessel pitting 9 – 19 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma vasicentric, diffuse in aggregate forming uniseriate tangential bands and storied. Rays 1– 7 (mostly 3 – 4) cells wide, 2–57 cells high, 3 – 9 per mm, heterocellular, consisting of procumbent cells with one row of upright cells on both sides.

BASIC SPECIFIC GRAVITY 0.36

STRENGTH GROUP E

DURABILITY - Non-durable

TREATABILITY - Easy

SEASONING - Seasons very fast with almost no degrade.

Recommended Kiln Schedule:

- C (Proposed)

WORKING PROPERTIES

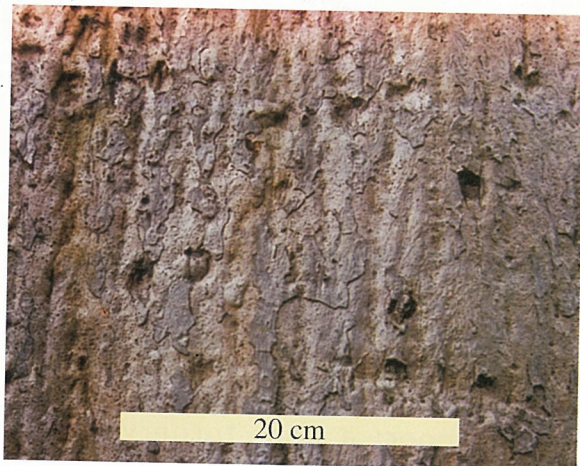
Saws well, works easily with hand and machine tools, planing good, nailing and boring moderately good, a poor turnery wood; mortising also poor.

RECOMMENDED END USES

Packing box, match box, toys, musical instruments.



Timber specimen



Bark



A plant in natural habit

Didu

Salmalia insignis Schott. & Endl.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

DWABOK

Kydia calycina Roxb.

FAMILY - Malvaceae

HABIT

A large tree reaching a height of 34 m, with trunk diameter of 0.5 to 0.6 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood brownish grey to whitish grey, sharply demarcated from white to yellowish white sapwood. Lustrous, straight-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 35% solitary, radial multiples of 2 – 3, occasionally pore clusters, 4 – 9 per mm², 61 – 297 (187) µm in diameter. Vessel length 221 – 389 (310) µm. Intervessel pitting 5 – 8 µm, alternate, vessel ray pitting 3 – 5µm, alternate. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma vasicentric, aliform, aliform confluent, diffuse and terminal bands. Axial parenchyma contain crystals. Rays 1 – 6 (mostly 2 – 3) cells wide, 2 – 36 cells high, 4 – 10 per mm, heterocellular, consisting of procumbent cells with one to four rows of upright cells on one side and among the procumbent cells. Ray parenchyma consist of crystals.

BASIC SPECIFIC GRAVITY 0.43

STRENGTH GROUP D

DURABILITY - Non-durable

TREATABILITY - Very easy

SEASONING - Seasons very slowly with slight degrade.

Recommended Kiln Schedule:

B (Proposed)

WORKING PROPERTIES

The timber is easy to saw and works well with hand and machine tools; plane satisfactory, nailing also well; boring poor; a poor turnery wood; mortising properties poor.

RECOMMENDED END USES

Packing box, match box, pencil wood.



Timber specimen



A plant in natural habit
Dwabok
Kydia calycina Roxb.



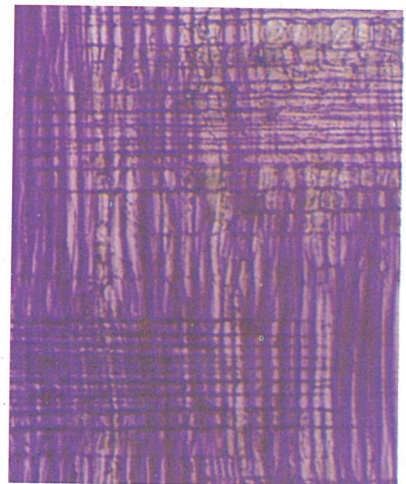
Bark



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

DWANI

Eriolaena candollei Wall.

FAMILY - Sterculiaceae

HABIT

A large tree reaching a height of 33 m, with trunk diameter of 0.7 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood red to yellowish red with grey to brown streaks, sharply demarcated from greyish brown to grey sapwood. Dull but sometimes slightly lustrous, straight-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 42% solitary, radial multiples of 2 – 4, frequently pore clusters, 5 – 22 per mm², 31 – 246 (109) µm in diameter. Vessel pores contain tyloses. Vessel length 236 – 389 (343) µm. Intervessel pitting 3 – 5 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma vasicentric, aliform, aliform confluent forming relatively long bands, diffuse, diffuse in aggregate and terminal bands. Prismatic crystals in 2 to 16 chambered axial parenchyma. Rays 1 – 5 (mostly 3 – 4) cells wide, 2 – 31 cells high, 6 – 12 per mm, heterocellular, consisting of procumbent cells with one to two rows of upright cells on one side and among the procumbent cells. Ray parenchyma consist of gum deposits.

BASIC SPECIFIC GRAVITY 0.72

STRENGTH GROUP A

DURABILITY - Very durable

TREATABILITY - Difficult

SEASONING - Seasons very slowly with almost no degrade.

Recommended Kiln Schedule:

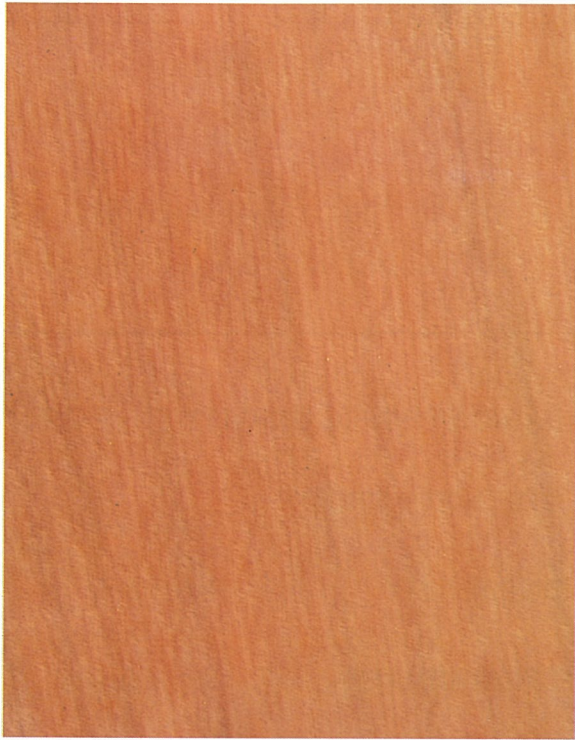
- B (Proposed)

WORKING PROPERTIES

The timber saws well and easy to work with hand and machine tools; planes very good, dresses rather smoothly; nailing and boring satisfactory; a good turnery wood, mortising good.

RECOMMENDED END USES

House building, furniture, panelling, interior finish, flooring, veneers, ply wood, agricultural implement.



Timber specimen

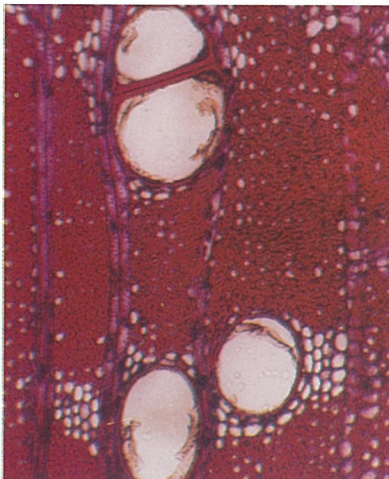


Bark



A plant in natural habit

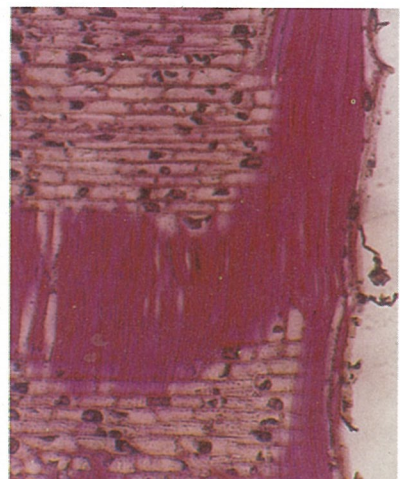
Dwani
Eriolaena candollei Wall.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

GWE

Spondias pinnata (L.) Kz.

FAMILY- Anacardiaceae

HABIT

A large tree reaching a height of 27 m with trunk diameter of 0.6 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from white to greyish white sapwood. Dull but sometimes slightly lustrous, straight-grained, texture very coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 69% solitary, radial multiples of 2 – 4, sometimes pore clusters, 2 – 7 per mm², 51 – 278 (191) µm in diameter. Vessel pores containing tyloses. Vessel length 79 – 1486 (728) µm. Intervessel pitting 10 – 15µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma very sparse. Rays 1 – 4 (mostly 3 – 4) cells wide, 1 – 37 cells high, 2 – 7 per mm, heterocellular, consisting of procumbent cells with one row of upright cells on both sides. Multiseriate rays sometimes containing gum canals.

BASIC SPECIFIC GRAVITY 0.28

STRENGTH GROUP E

DURABILITY - Perishable

TREATABILITY - Very easy

SEASONING - Seasons very fast with almost no degrade.

Recommended Kiln Schedule:

- B (Proposed)

WORKING PROPERTIES

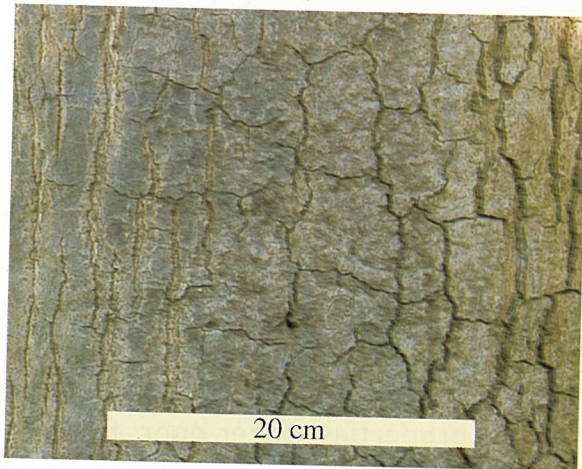
Saws well, easy to work with hand and machine tools, planing moderately good, nails and bores well, turning poor, mortising also poor.

RECOMMENDED END USES

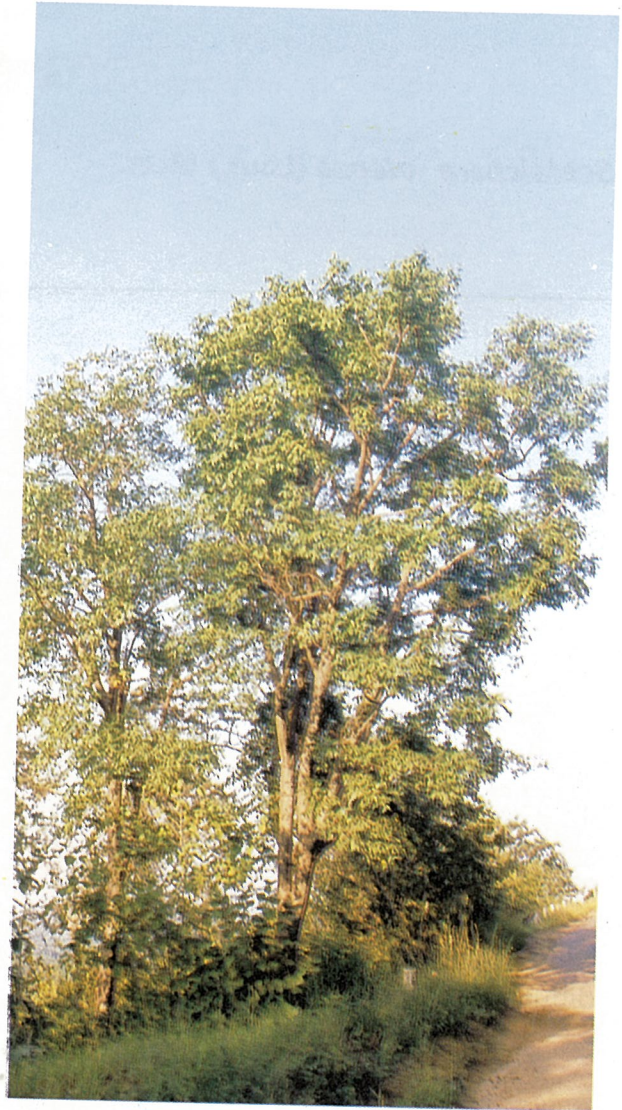
Packing box, match box, pencil wood.



Timber specimen

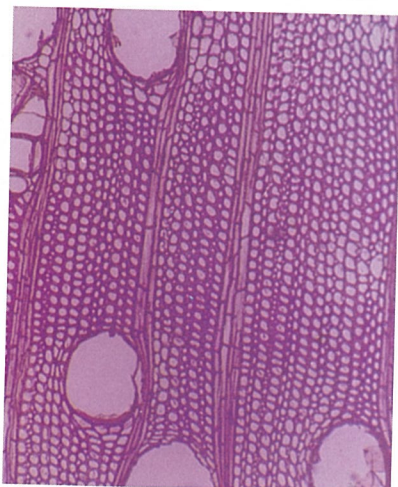


Bark



A plant in natural habit

Gwe
Spondias pinnata (L.) Kz.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

GYO

Schleichera oleosa (Lour.) Merr.

FAMILY - Sapindaceae

HABIT

A large tree reaching a height of 27 m with trunk diameter of 0.6 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood yellowish brown to pale reddish brown, sharply demarcated from yellowish white to pale brownish white rather thin sapwood. Dull, irregularly interlocked-grained, texture medium and even, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 56 % solitary, radial multiples of 2 – 4, 7 – 14 per mm², 31 – 123 (73) µm in diameter. Vessel pores sometimes contain gum deposits. Vessel length 308 – 615 (434) µm. Intervessel pitting 3 – 8 µm, alternate, vessel ray 3 – 5 µm, alternate to opposite. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma vasicentric, aliform and diffuse. Axial parenchyma consist of crystals. Rays 1 – 3 (mostly 1) cells wide, 3 – 42 cells high, 15 – 23 per mm, homocellular, consisting of only procumbent cells. Rays contains crystals and gum deposits

BASIC SPECIFIC GRAVITY 0.94

STRENGTH GROUP A

DURABILITY - Very durable

TREATABILITY - Difficult

SEASONING - Seasons very slowly with much degrade.

Recommended Kiln Schedule: E

WORKING PROPERTIES

The wood is very hard, difficult to saw and machine and saw blades are often broken; planes fairly, nailing and boring properties rather poor; turning satisfactory and mortising moderate.

RECOMMENDED END USES

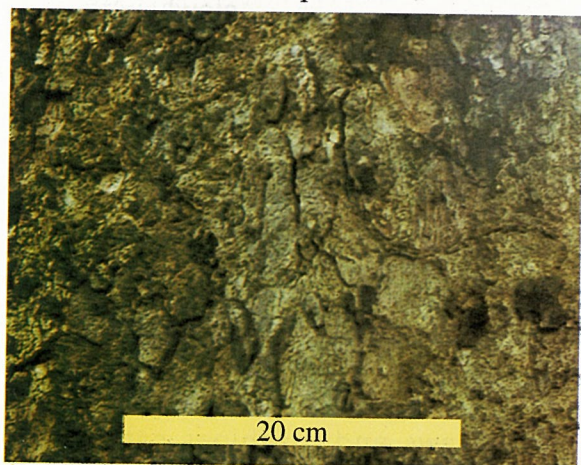
House building, sleepers, agricultural implement, tool handles.



Timber specimen



A plant in natural habit

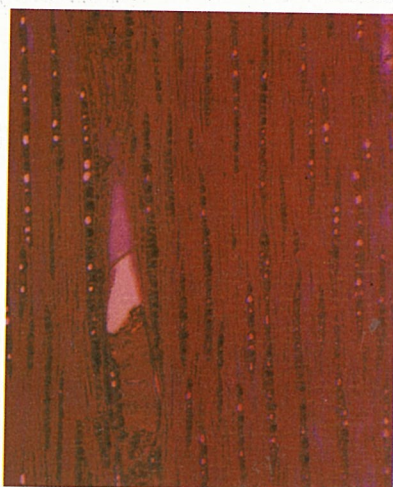


Bark

Gyo
Schleichera oleosa (Lour.) Merr.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

HMYASEIK

Antiaris toxicaria (Pers.) Lesch.

FAMILY - Moraceae

HABIT

A large tree reaching a height of 38 m with trunk diameter of 0.5 to 0.9m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from white to light brownish white sapwood. Dull, straight-grained, texture coarse, without distinctive odour and taste, wood diffusely porous.

MICROSCOPIC CHARACTERISTICS

Average 50% solitary, radial multiples of 2 – 4, 9 – 13 per mm², 92 – 256 (149) mm in diameter. Vessel length 215 – 636 (439) mm. Intervessel pitting 3 – 7 mm, alternate, vessel ray pitting 7 – 15 mm, opposite to alternate. Perforation plates simple. Fibres thin-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma vasicentric, aliform, aliform confluent and diffuse in aggregate. Rays 1 – 6 (mostly 5) cells wide, 2 – 49 cells high, 4 – 7 per mm, heterocellular, consisting of procumbent cells with one to two rows of upright cells on both sides.

BASIC SPECIFIC GRAVITY 0.33

STRENGTH GROUP E

DURABILITY - Perishable

TREATABILITY - Easy

SEASONING - Seasons very slowly with almost no degrade.

Recommended Kiln Schedule:
C (proposed)

WORKING PROPERTIES

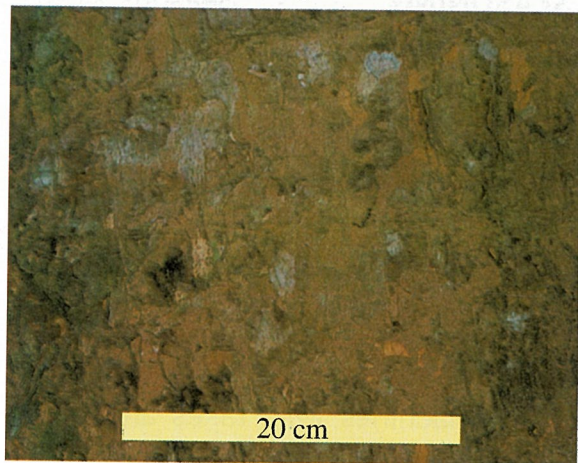
Saws and machines satisfactory, planing good, nailing and boring moderately good, a poor turnery wood, mortising also poor.

RECOMMENDED END USES

Packing box, match box, pencil wood.



Timber specimen



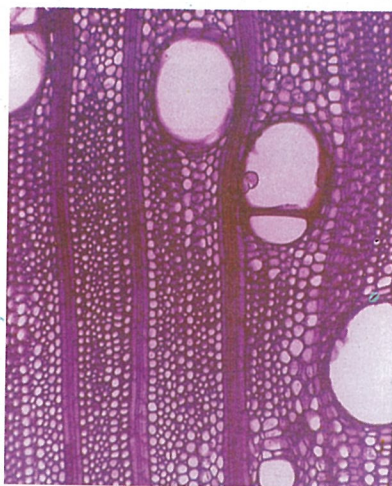
Bark



A plant in natural habit

Hmyaseik

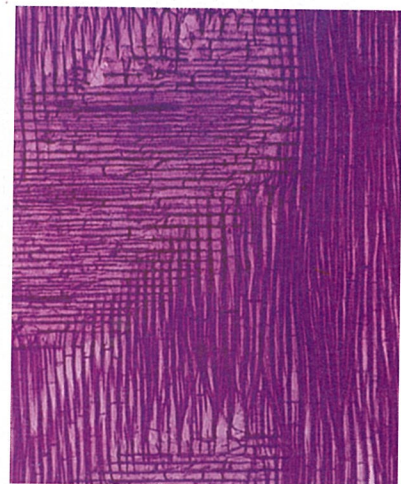
Antiaris toxicaria (Pers.) Lesch.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

HNAW

Adina cordifolia Hk. f.

FAMILY - Rubiaceae

HABIT

A large tree reaching a height of 27 m, with trunk diameter of 0.5 to 0.9 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from yellowish to reddish brown sapwood. Lustrous, fairly straight-grained, texture very fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 70% solitary, radial multiples of 2 – 5, 41 – 59 per mm², 21 – 92 (54) µm in diameter. Vessel length 481 – 1179 (796) µm. Intervessel pitting 5 – 8 µm, alternate to opposite, vessel ray pitting 3 – 5 µm, alternate. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma scanty, diffuse and diffuse in aggregate. Rays 1 – 2 (mostly 2) cells wide, 2 – 38 cells high, 9 – 19 per mm, heterocellular, consisting of procumbent cells with one to fourteen rows of upright cells on one or both sides and among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.60

STRENGTH GROUP C

DURABILITY - Moderately durable

TREATABILITY - Average

SEASONING - Seasons slowly with little degrade.

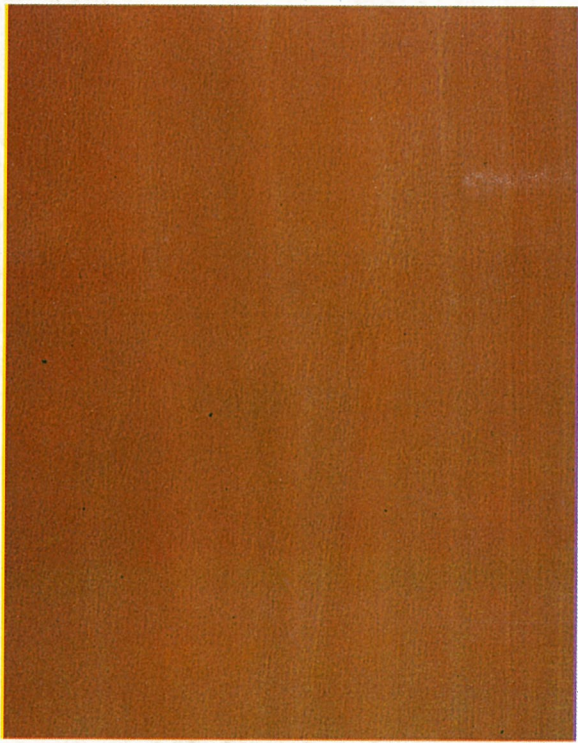
Recommended Kiln Schedule: E

WORKING PROPERTIES

The timber saws well, works easily and finishes to a smooth surface; wood machines well; takes and holds nails moderately and bores poorly; moderate turnery and mortising.

RECOMMENDED END USES

Furniture, carving, pencil wood, decorative panelling, interior finish, joinery, house building, veneers, plywood.



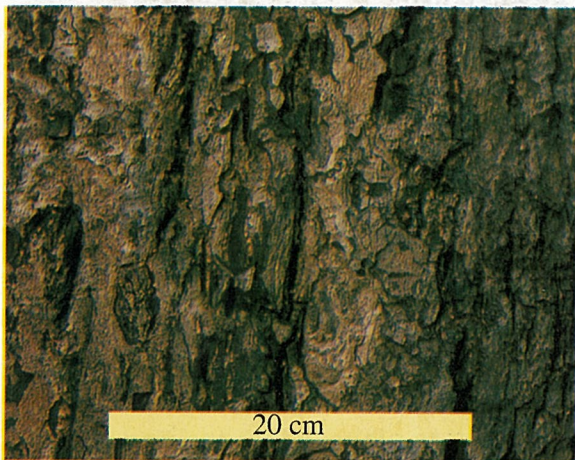
Timber specimen



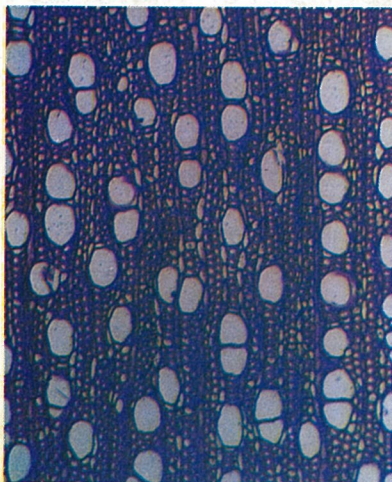
A plant in natural habit

Hnaw

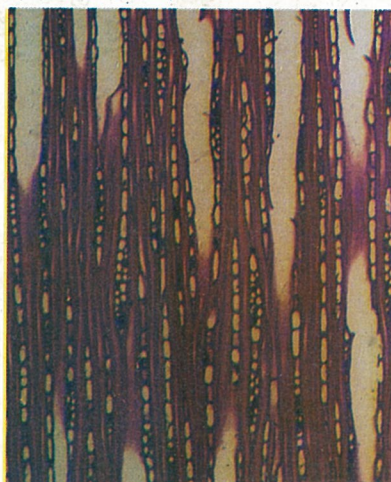
Adina cordifolia Hk. f.



Bark



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

KOKKO

Albizzia lebbek Benth.

FAMILY - Mimosaceae

HABIT

A large tree reaching a height of 32 m, with trunk diameter of 0.5 to 1.2 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood yellowish brown to dark brown, sharply demarcated from white to yellowish white sapwood. Lustrous, interlocked-grained but sometimes straight-grained, texture very coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 67% solitary, radial multiples of 2 – 4, occasionally pore clusters, 1 – 10 per mm², 21 – 277 (125) µm in diameter. Vessel length 123 – 420 (269) µm. Intervessel pitting 3 – 6 µm, alternate, vessel ray pitting 8 – 10 µm, alternate. Perforation plates simple. Fibres thin-walled, non-septate, very occasionally septate, with minute slit-like pits in radial walls. Axial parenchyma typically vasicentric and aliform. Axial parenchyma contain crystals and gum deposits. Rays 1 – 4 (mostly 3 – 4) cells wide, 4 – 31 cells high, 4 – 9 per mm, homocellular, consisting of only procumbent cells.

BASIC SPECIFIC GRAVITY 0.54

STRENGTH GROUP C

DURABILITY - Moderately durable

TREATABILITY - Difficult

SEASONING - Seasons slowly with almost no degrade.

Recommended Kiln Schedule: B

WORKING PROPERTIES

Rather difficult to saw and machine because of interlocked-grained, difficult to plane with hand and machine tools; takes a smooth surface and finishes well; good for turnery; mortising satisfactory.

RECOMMENDED END USES

House building, furniture, panelling, interior finish, musical instruments, agricultural implement, household appliances, and carving.



Timber specimen



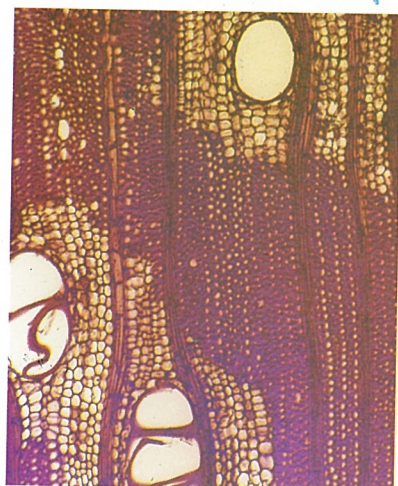
Bark



A plant in natural habit

Kokko

Albizia lebbek Benth.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

KUTHAN

Hymenodictyon excelsum Wall.

FAMILY - Rubiaceae

HABIT

A large tree reaching a height of 27 m, with trunk diameter of 0.6 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from pale yellowish grey to brownish grey sapwood. Lustrous, straight-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 42% solitary, radial multiples of 2 – 5, 6 – 13 per mm², 72 – 215 (146) µm in diameter. Vessel length 431 – 1384 (918) µm. Intervessel pitting 4 – 8 µm, alternate, vessel ray pitting 5 – 8 µm, alternate. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma scanty, diffuse and diffuse in aggregate. Rays 1 – 3 (mostly 1 – 2) cells wide, 1 – 39 cells high, 8 – 17 per mm, heterocellular, consisting of procumbent cells with one to thirteen rows of upright cells on one or both sides and among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.40

STRENGTH GROUP E

DURABILITY - Non-durable

TREATABILITY - Very easy

SEASONING - Seasons fast with almost no degrade.

Recommended Kiln Schedule: C

WORKING PROPERTIES

The wood saws and machines easily, produce smooth surface and rated as good to excellent; turns and shapes well; nailing and boring also well; turning satisfactory and mortising moderate.

RECOMMENDED END USES

Furniture, panelling, interior finish, packing box, match box, pencil wood.



Timber specimen



A plant in natural habit

Kuthan

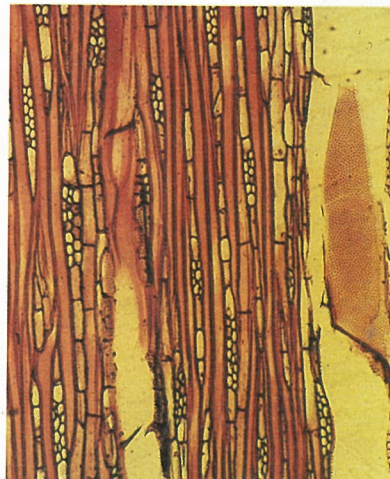
Hymenodictyon excelsum Wall.



Bark



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

KYETYO

Vitex peduncularis Wall.

FAMILY - Verbenaceae

HABIT

A large tree reaching a height of 30 m with trunk diameter of 0.6 to 0.8 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood reddish yellow to reddish brown, sharply demarcated from the light brown to brown or greyish brown sapwood. Slightly lustrous, straight-grained, texture fine and even, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 71% solitary, radial multiples of 2 – 7, 6 – 13 per mm², 31 – 133 (91) µm in diameter. Vessel pores contain tyloses and gum deposits. Vessel length 226 – 389 (305) µm. Intervessel pitting 8 – 10 µm, alternate, vessel ray pitting 5 – 8 µm, alternate. Perforation plates simple. Fibres thick-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma scanty and diffuse. Rays 1 – 3 (mostly 2 – 3) cells wide, 2 – 26 cells high, 8 – 16 per mm, homocellular, consisting of only procumbent cells.

BASIC SPECIFIC GRAVITY 0.76

STRENGTH GROUP B

DURABILITY - Durable

TREATABILITY - Very difficult

SEASONING - Seasons fast and care is needed to avoid checks and split.

Recommended Kiln Schedule: D

WORKING PROPERTIES

The timber is hard and difficult to saw and machine, planes well, nailing and boring properties rather poor, turns well, mortising satisfactory.

RECOMMENDED END USES

House building, tool handles, sleepers, agricultural implement.



Timber specimen



Bark



A plant in natural habit

Kyetyo

Vitex peduncularis Wall.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

LEIN

Terminalia pyrifolia Kz.

FAMILY - Combretaceae

HABIT

A large tree reaching a height of 34 m with trunk diameter of 0.7 to 0.9 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from pale yellow or whitish yellow to yellowish grey sapwood. Lustrous, fairly straight-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 59% solitary, radial multiples of 2 – 3, 1 – 8 per mm², 72 – 205 (134) µm in diameter. Vessel length 195 – 620 (450) µm. Intervessel pitting 5 – 15 µm, alternate, vessel ray pitting 5 – 9 µm, opposite to alternate, vestured. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma wavy and occasionally forked bands. Axial parenchyma contain elongated crystals. Rays exclusively 1 (rarely 2) cells wide, 3 – 29 cells high, 15 – 23 per mm, homocellular, consisting of only procumbent cells.

BASIC SPECIFIC GRAVITY 0.64

STRENGTH GROUP C

DURABILITY - Moderately durable

TREATABILITY - Easy

SEASONING - Seasons fast with much degrade.

Recommended Kiln Schedule:
- C (proposed)

WORKING PROPERTIES

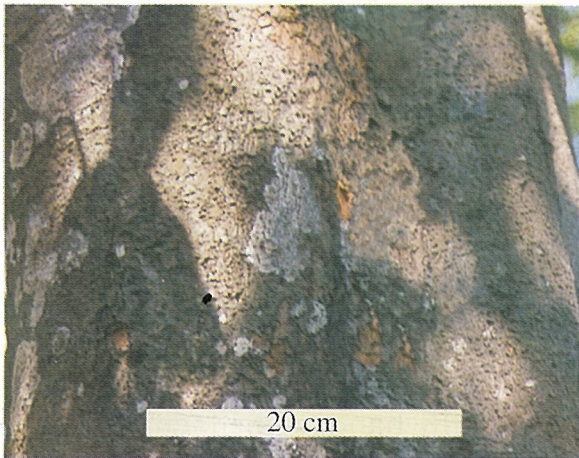
Saws and machines moderate, planing, nailing and boring fair, turning characteristics moderate, mortising satisfactory.

RECOMMENDED END USES

House building, furniture, axe-handles.



Timber specimen



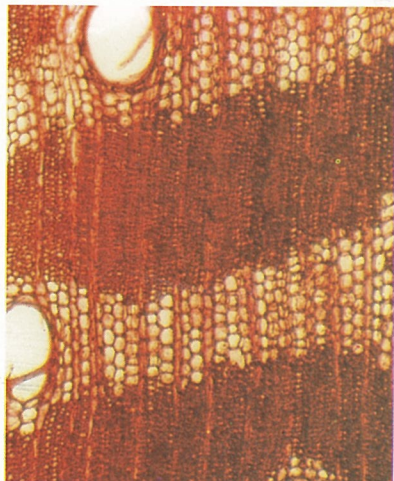
Bark



A plant in natural habit

Lein

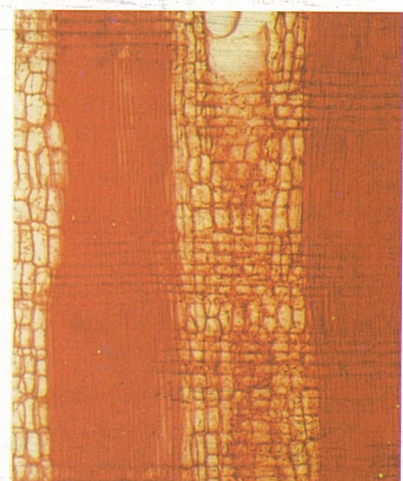
Terminalia pyrifolia Kz.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

LETPAN

Salmalia malabarica (DC.) Schott. & Endl.

FAMILY - Bombacaceae

HABIT

A large tree reaching a height of 46 m with trunk diameter of 0.8 to 1.0 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from brownish white to geryish white sapwood. Dull, straight-grained, texture very coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 63% solitary, radial multiples of 2 – 3 and sometimes pore clusters, 1 – 10 per mm², 52 – 348 (232) µm in diameter. Vessel length 185 – 677 (406) µm. Intervessel pitting 5 – 20 µm, alternate to opposite, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in radial and tangential walls. Axial parenchyma scanty, vasicentric, diffuse and diffuse in aggregate forming uniseriate bands. Axial parenchyma typically storied. Rays 1 – 6 (mostly 2 – 3) cells wide, 3 – 140 cells high, 3 – 8 per mm, heterocellular, consisting of procumbent cells with one to two rows of upright cells on one or both sides.

BASIC SPECIFIC GRAVITY 0.26

STRENGTH GROUP E

DURABILITY - Perishable

TREATABILITY - Easy

SEASONING - Seasons slowly with no degrade.

Recommended Kiln Schedule:

- C (Proposed)

WORKING PROPERTIES

The wood is easy to saw, works well with hand and machine tools; excellent in planing; nails and bores well, turning and mortising moderate.

RECOMMENDED END USES

Cheap furniture, toys, match-box, packing box.



Timber specimen



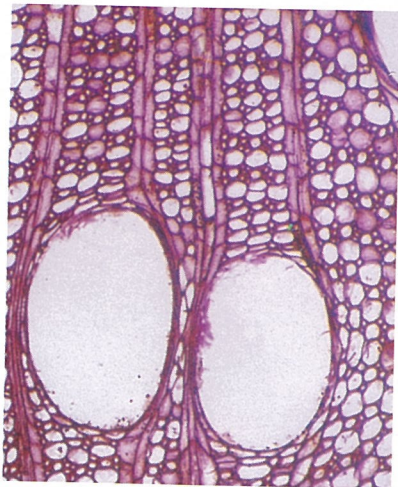
Bark



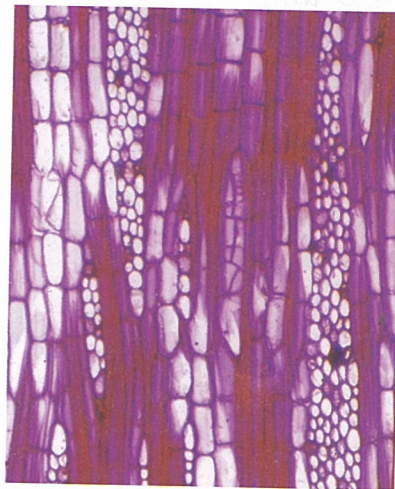
A plant in natural habit

Letpan

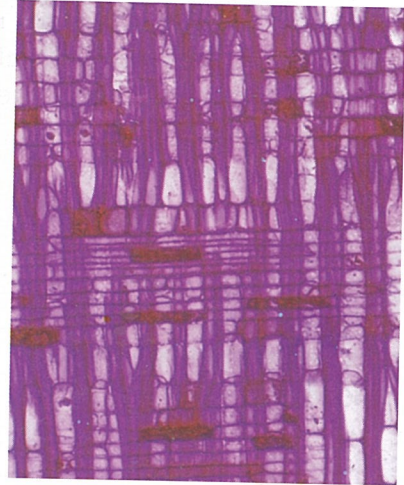
Salmalia malabarica (DC.) Schott. & Endl.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

LEZA

Lagerstroemia tomentosa Presl.

FAMILY - Lythraceae

HABIT

A large tree reaching a height of 37 m with trunk diameter of 0.6 to 1.2 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from whitish grey to yellowish grey sapwood. Lustrous, straight-grained, texture fine and even, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTIC

Average 53% solitary, radial multiples of 2 – 4, sometimes pore clusters, 8 – 30 per mm², 21 – 154 (93) µm in diameter. Some vessels consist of tyloses. Vessel length 226 – 431 (339) µm. Intervessel pitting 3 – 5 µm, alternate, vested, vessel ray pitting 5 – 8 µm, opposite. Perforation plates simple. Fibres thick-walled, septate, with minute simple, slit-like pits in radial walls. Axial parenchyma 3 – 11 seriate tangential wavy bands. Prismatic crystals in 3 to 17 chambered axial parenchyma. Rays 1 – 2 (mostly 1) cells wide, 1 – 22 cells high, 9 – 18 per mm, homocellular, consisting of only procumbent cells.

BASIC SPECIFIC GRAVITY 0.58

STRENGTH GROUP C

DURABILITY - Moderately durable

TREATABILITY - Difficult

SEASONING - Seasons slowly with slight degrade.

Recommended Kiln Schedule: C

WORKING PROPERTIES

The wood saws and machines well; good to moderately good in nailing and boring; turning and mortising properties well.

RECOMMENDED END USES

House building, furniture, panelling, interior finish, flooring, door and window frames.



Timber specimen

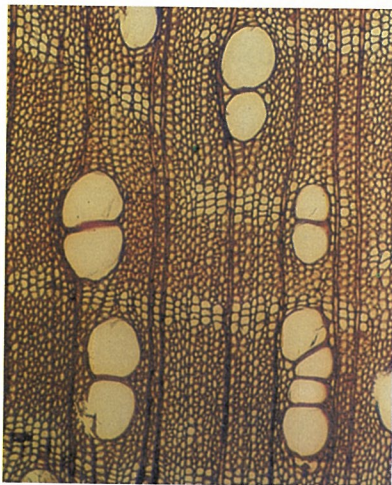


A plant in natural habit



Bark

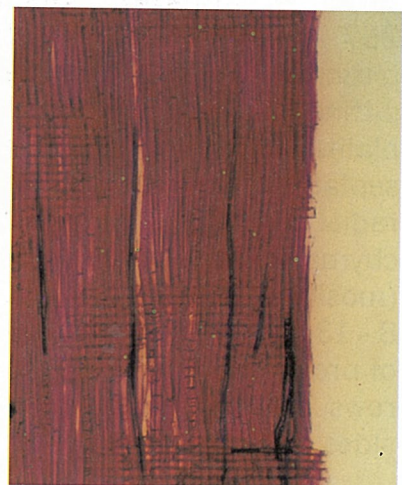
Leza
Lagerstroemia tomentosa Presl.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

MA-U-LETTAN-SHE

Anthocephalus cadamba Miq.

FAMILY - Rubiaceae

HABIT

A large tree reaching a height of 44 m, with trunk diameter of 0.7 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from pale yellowish white to pale yellowish grey sapwood. Lustrous, straight-grained, texture medium, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 59% solitary, radial multiples of 2 – 5, occasionally pore clusters, 2 – 9 per mm², 41 – 225 (145) µm in diameter. Vessel length 267 – 1117 (566) µm. Intervessel pitting 5 – 10 µm, alternate, vessel ray pitting 4 – 8 µm, alternate. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma scanty and diffuse. Rays 1 – 4 (mostly 3) cells wide, 2 – 52 cells high, 8 – 13 per mm, heterocellular, consisting of procumbent cells with one to eleven rows of upright cells on one or both sides and among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.44

STRENGTH GROUP D

DURABILITY - Non-durable

TREATABILITY - Easy

SEASONING - Seasons very slowly without any degrade.

Recommended Kiln Schedule:

- C (Proposed)

WORKING PROPERTIES

The timber is easy to saw and works well with hand and machine tools, planes fairly good, excellent in nailing and boring; turning and mortising properties poor.

RECOMMENDED END USES

Pencil wood, packing box, match box and toys.



Timber specimen



Bark



A plant in natural habit
Mia-u-lettan-she
Anthocephalus cadamba Mig.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

MYAUKCHAW

Homalium tomentosum Benth.

FAMILY - Flacourtiaceae

HABIT

A large tree reaching a height of 37 m, with trunk diameter of 0.7 to 0.9 m, long, straight, cylindrical stem which is buttressed.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from yellowish brown or greyish brown to pinkish brown sapwood. Dull, straight-grained but sometimes wavy-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 38% solitary, radial multiples of 2 – 5, 25 – 43 per mm², 21 – 92 (67) µm in diameter. Vessels contain gum deposits. Vessel length 992 – 1189 (1044) µm. Intervessel pitting 3 – 4 µm, alternate. Vessel ray pitting 3 – 5 µm, opposite to alternate. Perforation plates simple. Fibres thick-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma scanty and diffuse. Axial parenchyma consist of gum deposits. Rays 1 – 6 (mostly 3 – 4) cells wide, 2 – 153 cells high, 9 – 20 per mm, heterocellular, consisting of procumbent cells with one to two rows of upright cells among the procumbent cells. Upright cells of ray contain crystals.

BASIC SPECIFIC GRAVITY 0.78

STRENGTH GROUP B

DURABILITY - Durable

TREATABILITY - Average

SEASONING - Seasons very slowly with much degrade.

Recommended Kiln Schedule:
- D (Proposed)

WORKING PROPERTIES

Difficult to saw and machine, planing moderate, poor nailing and boring properties, turns well, mortising satisfactory.

RECOMMENDED END USES

House building, sleepers, door and window frames, veneers, plywood.



Timber specimen



Bark



A plant in natural habit

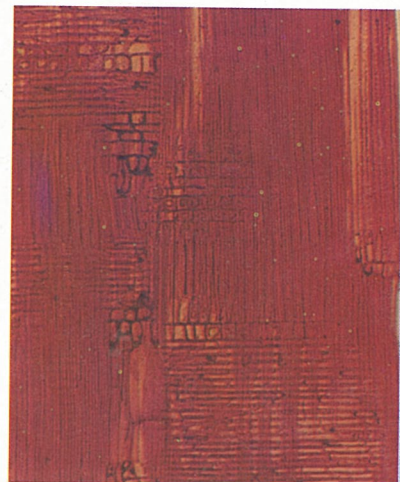
Myaukchaw
Homalium tomentosum Benth.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

MYAUKNGO

Duabanga grandiflora (Roxb.) Walp.

FAMILY - Lythraceae

HABIT

A large tree reaching a height of 26 m, with trunk diameter of 0.7 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood light brown to greyish brown, not sharply demarcated from sapwood. Lustrous, straight-grained but sometimes irregularly interlocked-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 52% solitary, radial multiples of 2 – 3, 2 – 7 per mm², 92 – 297 (185) µm in diameter. Vessel pores contain tyloses. Vessel length 461 – 1076 (658) µm. Intervessel pitting 3 – 13 µm, alternate, vessel ray pitting 10 – 15 µm, opposite to alternate. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma vasicentric and diffuse. Rays 1 – 2 (mostly 1) cells wide, 2 – 36 cells high, 7 – 15 per mm, heterocellular, consisting of procumbent cells with one to six rows of upright cells on one or both sides and among the procumbent cells. Ray parenchyma consists of gum deposits.

BASIC SPECIFIC GRAVITY 0.46

STRENGTH GROUP E

DURABILITY - Non-durable

TREATABILITY - Very easy

SEASONING - Seasons slowly with little degrade.

Recommended Kiln Schedule: C

WORKING PROPERTIES

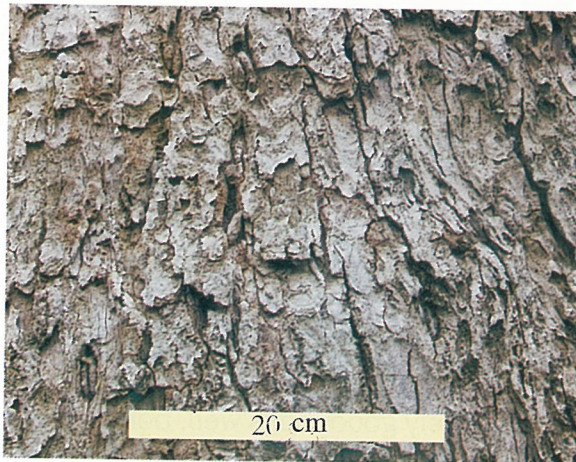
Excellent in sawing, works well with hand and machine tools, planing and nailing well and good screw holding properties, turning and mortising fairly poor.

RECOMMENDED END USES

Panelling, interior finish, furniture, veneers, plywood, packing box, match box, planks.



Timber specimen



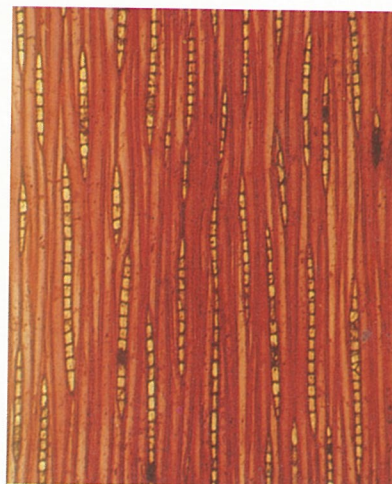
Bark



A plant in natural habit
Myaukngo
Duabanga grandiflora (Roxb.) Walp.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

MYAUK-THWE-GYI

Myristica spp.

FAMILY - Myristicaceae

HABIT

A large tree reaching a height of 41 m, with trunk diameter of 0.7 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood brown to greyish brown, not sharply demarcated from sapwood. Lustrous, straight-grained, texture medium-coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 29% solitary, radial multiples of 2 – 4, 3 – 9 per mm², 72 – 205 (121) µm in diameter. Vessel length 349 – 1281 (926) µm. Intervessel pitting 5 – 20 µm, alternate, vessel ray pitting 5 – 42 µm, alternate to opposite. Perforation plates simple, sometimes scalariform. Fibres thin-walled, septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma scanty, vasicentric and diffuse. Rays 1 – 4 (mostly 2) cells wide, 2 – 44 cells high, 7 – 12 per mm, heterocellular, consisting of procumbent cells with one to eight rows of upright cells on one or both sides. Ray parenchyma sometimes contain gum deposits.

BASIC SPECIFIC GRAVITY 0.34

STRENGTH GROUP E

DURABILITY - Perishable

TREATABILITY - Very easy

SEASONING - Seasons very fast without any defects.

Recommended Kiln Schedule:

B (Proposed)

WORKING PROPERTIES

Saws well, easy to work with both hand and machine tools, planes moderately good, nails well, boring fairly good, turning and mortising poor.

RECOMMENDED END USES

Panelling, interior finish.



Timber specimen

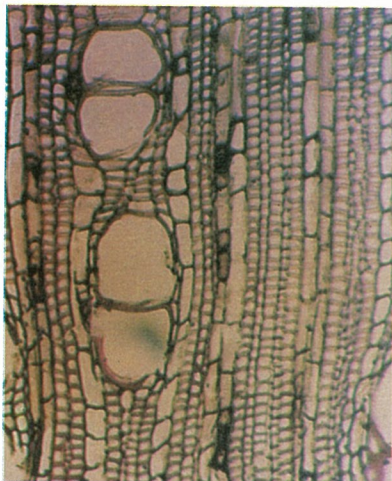


A plant in natural habit

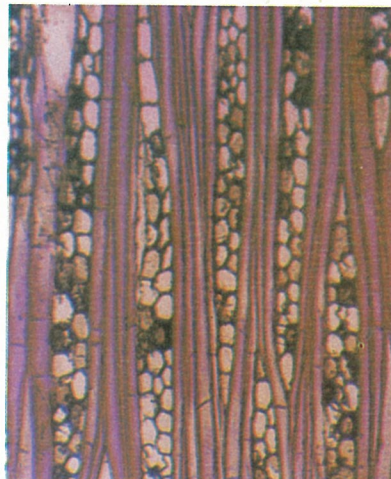
Myauk-thwe-gyi
Myristica spp.



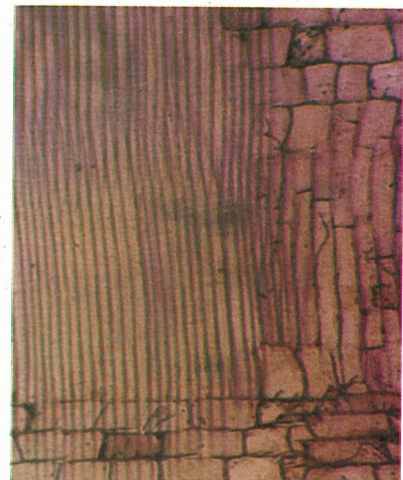
Bark



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

MYAUK-THWE-THE

Myristica angustifolia Roxb.

FAMILY - Myristicaceae

HABIT

A large tree reaching a height of 23 m, with trunk diameter of 0.5 to 0.6 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood; not sharply demarcated from pinkish or pale reddish brown to greyish brown sapwood. Lustrous, straight-grained, texture medium-coarse, without distinctive odour and taste, diffuse-porous wood.

MICROSCOPIC CHARACTERISTICS

Average 49% solitary, radial multiples of 2 – 3, 5 – 13 per mm², 72 – 164 (112) µm in diameter. Vessel length 287 – 1117 (725) µm. Intervessel pitting 5–10 µm, opposite to alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple, sometimes scalariform. Fibres thin-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma tangential bands with 2 to 10 seriate, diffuse and diffuse in aggregate. Rays 1 – 3 (mostly 2) cells wide, 2 – 30 cells high, 8 – 17 per mm, heterocellular, consisting of procumbent cells with two to ten rows of upright cells on both sides or among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.55

STRENGTH GROUP C

DURABILITY - Perishable

TREATABILITY - Very easy

SEASONING - Seasons very fast with slight degrade.

Recommended Kiln Schedule:
E (Proposed)

WORKING PROPERTIES

Excellent in sawing, easy to work with hand and machine tools, planes well, nailing and boring moderately good, turns satisfactory, mortising moderate.

RECOMMENDED END USES

Panelling, interior finish.



Timber specimen

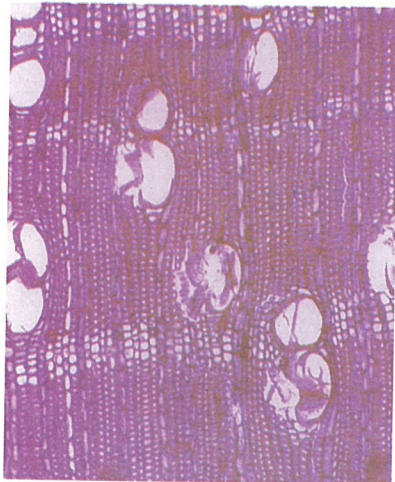


Bark



A plant in natural habit

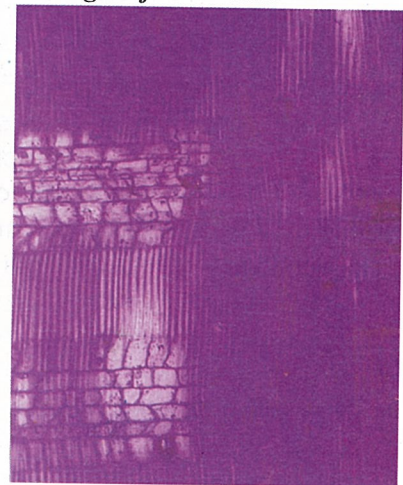
Myauk-thwe-the
Myristica angustifolia Roxb.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

NABE

Lannea coromandelica (Houtt.) Merr.

FAMILY - Anacardiaceae

HABIT

A large tree reaching a height of 36 m with trunk diameter of 0.6 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood pinkish red or pale red to red or brownish red, sharply demarcated from the yellowish white to brownish grey sapwood. Dull, straight-grained but sometimes interlocked-grained, texture medium and even, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 37% solitary, radial multiples of 2 – 4, occasionally pore clusters, 7 – 15 per mm², 62 – 195 (129) μm in diameter. Vessel pores contain tyloses. Vessel length 277 – 779 (470) μm . Intervessel pitting 8 – 18 μm , alternate to opposite, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma very sparse. Axial parenchyma consists of gum deposits. Rays 1 – 5 (mostly 3 – 4) cells wide, 6 – 27 cells high, 6 – 9 per mm, heterocellular, consisting of procumbent cells with one to two rows of upright cells on one or both sides. Ray parenchyma contain gum deposits. Multiseriate rays sometimes consist of gum canals.

BASIC SPECIFIC GRAVITY 0.67

STRENGTH GROUP C

DURABILITY - Non-durable

TREATABILITY - Moderately difficult

SEASONING - Seasons very slowly with little degrade.

Recommended Kiln Schedule: D

WORKING PROPERTIES

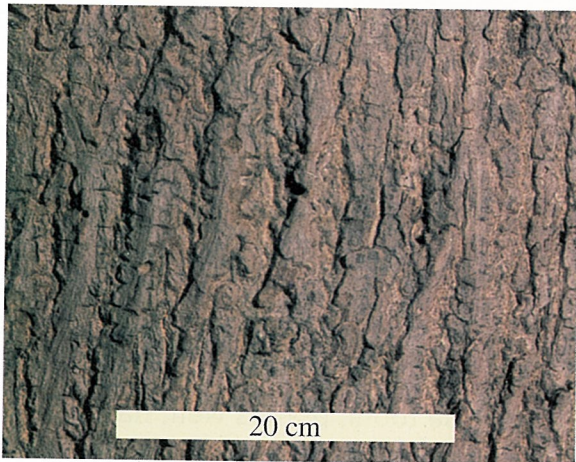
Saws fairly good, a moderately good machining wood, planes well, nailing moderately good, turning and mortising characteristics moderate.

RECOMMENDED END USES

Planking, boxes, carts, staircase components, house building, agricultural implement.



Timber specimen



Bark



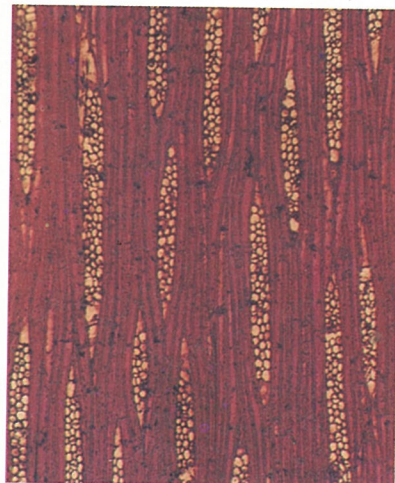
A plant in natural habit

Nabe

Lannea coromandelica (Houtt.) Merr.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

PANGA

Terminalia chebula Retz.

FAMILY - Combretaceae

HABIT

A large tree reaching a height of 47 m, with trunk diameter of 0.6 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood dark brown or greyish brown to purplish brown, sharply demarcated from yellowish to light brownish grey sapwood. Slightly lustrous, interlocked-grained, texture medium-fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 72% solitary, radial multiples of 2 – 4, sometimes pore clusters, 6 – 16 per mm², 31 – 113 (74) µm in diameter. Vessel pores contain gum deposits. Vessel length 215 – 604 (432) µm. Intervessel pitting 3 – 5 µm, opposite to alternate, vested, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma vasicentric, unilateral, aliform, aliform confluent and diffuse. Axial parenchyma contain gum deposits and crystals. Rays exclusively 1 (rarely 2) cells wide, 3 – 47 cells high, 10 – 23 per mm, heterocellular, consisting of procumbent cells with one row of upright cells among the procumbent cells. Ray parenchyma consist of crystals and gum deposits.

BASIC SPECIFIC GRAVITY 0.78

STRENGTH GROUP A

DURABILITY - Durable

TREATABILITY - Difficult

SEASONING - Seasons very slowly with almost no degrade.

Recommended Kiln Schedule:

- D (Proposed)

WORKING PROPERTIES

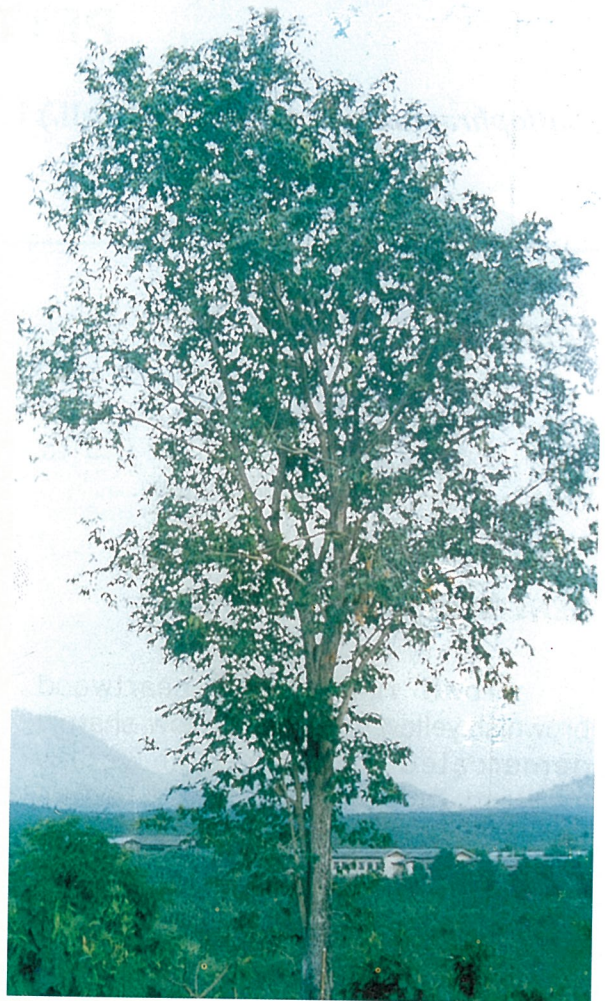
The timber is hard and difficult to saw, works fairly easy with hand and machine tools; planes well, nailing and boring moderate; turnery fairly good, mortising satisfactory.

RECOMMENDED END USES

House building, furniture, carts, tool-handles, sleepers, veneers, plywood.



Timber specimen

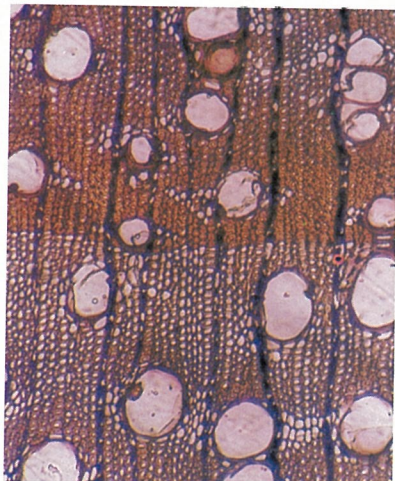


A plant in natural habit

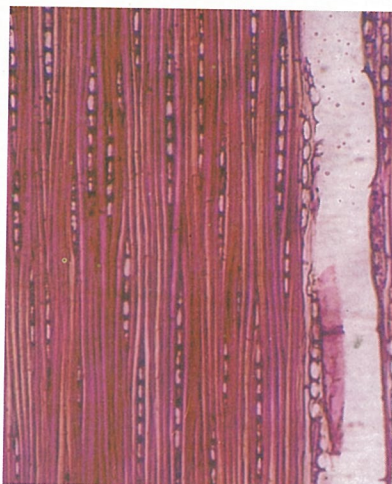


Bark

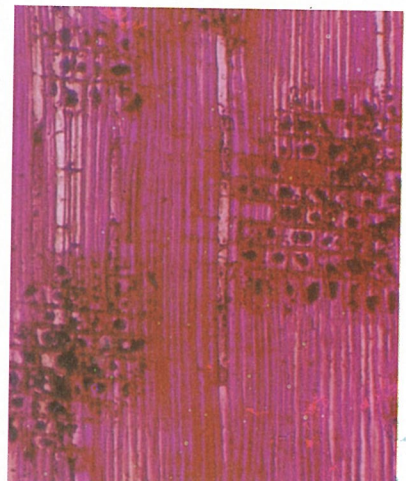
Panga
Terminalia chebula Retz.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

PETTHAN

Haplophragma adenophyllum (Wall.) Dop.

FAMILY - Bignoniaceae

HABIT

A large tree reaching a height of 29 m with trunk diameter of 0.5 to 0.8 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood brownish yellow to reddish yellow, sharply demarcated from the pale yellow sapwood. Dull, straight-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 48% solitary, radial multiples of 2 – 5, sometimes pore clusters, 9 – 29 per mm², 51 – 185 (137) µm in diameter. Vessel length 195 – 379 (306) µm. Intervessel pitting 3 – 4 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma vasicentric, aliform, aliform confluent forming relatively long bands, diffuse and uniseriate terminal band. Rays 1 – 4 (mostly 3) cells wide, 2–48 cells high, 5–9 per mm, homocellular, consisting of only procumbent cells.

BASIC SPECIFIC GRAVITY 0.75

STRENGTH GROUP A

DURABILITY - Durable

TREATABILITY - Very difficult

SEASONING - Seasons very slowly with slight degrade.

Recommended Kiln Schedule: C

WORKING PROPERTIES

Moderately hard and difficult to saw, planing and nailing well, boring moderately good, turns well, mortising moderately good.

RECOMMENDED END USES

Planking, cabinet work, house building, furniture, flooring, sleepers, veneers, plywood.



Timber specimen



Bark



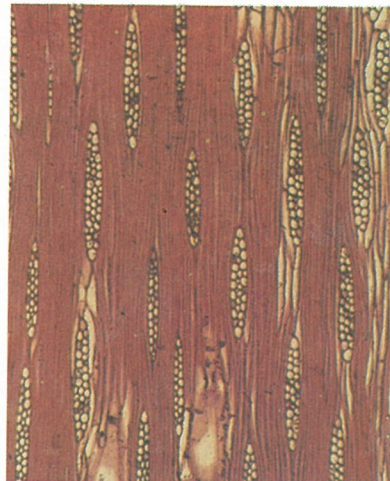
A plant in natural habit

Petthan

Haplophragma adenophyllum (Wall.) Dop.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

PYAUKSEIK

Holoptelea integrifolia Planch.

FAMILY - Ulmaceae

HABIT

A large tree reaching a height of 35 m with trunk diameter of 1.0 to 1.2 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood whitish yellow to light yellowish grey, not sharply demarcated from the sapwood. Lustrous, irregularly interlocked-grained, texture medium and even, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 63% solitary, radial multiples of 2 – 4, sometimes pore clusters, 8 – 21 per mm², 51 – 171 (119) µm in diameter. Vessel length, 205 – 328 (270) µm. Intervessel pitting 6 – 8 µm, alternate, vessel ray pitting similar to intervessel pits. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma scanty, unilateral, aliform, aliform confluent, diffuse and diffuse in aggregate. Rays 1 – 5 (mostly 4) cells wide, 3 – 42 cells high, 8 – 13 per mm, heterocellular, consisting of procumbent cells with one to three rows of upright cells on one or both sides and among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.57

STRENGTH GROUP C
DURABILITY - Moderately durable

TREATABILITY - Easy

SEASONING - Seasons very slowly with almost no degrade.

Recommended Kiln Schedule:
- C (Proposed)

WORKING PROPERTIES

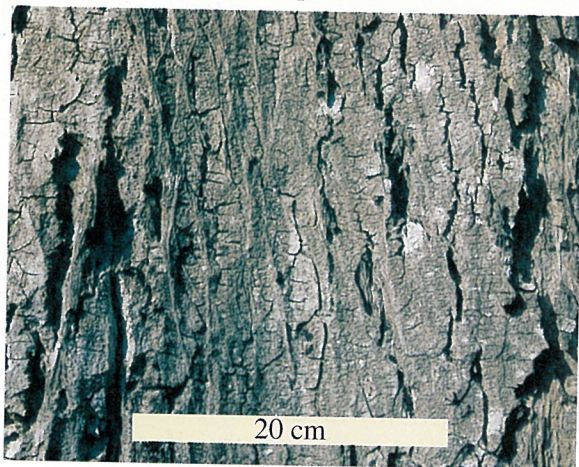
The timber saws easily and works with hand and machine tools; planes satisfactory; nailing and boring moderate; a fair turnery wood, mortising satisfactory.

RECOMMENDED END USES

House building, carts, combs, veneers, plywood, agricultural implement, household appliances, pencil wood.



Timber specimen

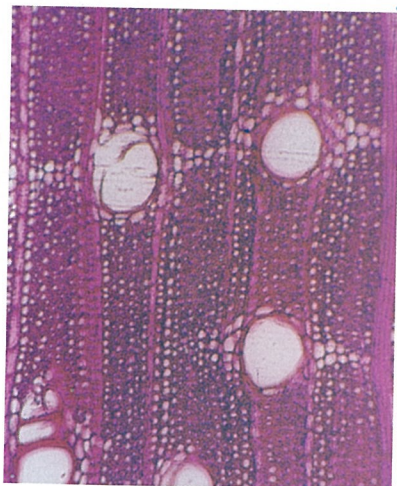


Bark



A plant in natural habit

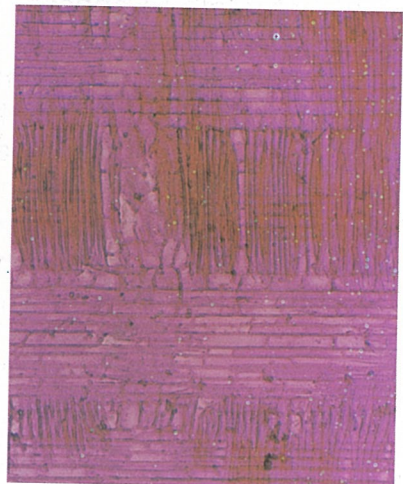
Pyaukseik
Holoptelea integrifolia Planch.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

PYINMA

Lagerstroemia speciosa (L.) Pers.

FAMILY - Lythraceae

HABIT

A large tree reaching a height of 31 m, with trunk diameter of 0.5 to 0.7 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood reddish brown, sharply demarcated from light brown to greyish brown sapwood. Slightly lustrous, straight-grained, texture medium-coarse, without distinctive odour and taste, wood semi-ring-porous.

MICROSCOPIC CHARACTERISTICS

Average 81% solitary, radial multiples of 2 – 4, 2 – 9 per mm², 51– 297 (141) µm in diameter. Some vessels contain tyloses. Vessel length 271– 523 (388) µm. Intervessel pitting 8 µm, alternate to opposite, vested, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma aliform, aliform confluent forming 2 to 4 seriate tangential bands and diffuse. Prismatic crystals in 2 to 18 chambered axial parenchyma. Rays 1 – 3 (mostly 1 – 2) cells wide, 4 – 23 cells high, 11 – 19 per mm, homocellular consisting of only procumbent cells. Some ray parenchyma consist of gum deposits.

BASIC SPECIFIC GRAVITY 0.53

STRENGTH GROUP D

DURABILITY - Durable

TREATABILITY - Very difficult

SEASONING - Seasons very slowly and care is needed to avoid warping.

Recommended Kiln Schedule: B

WORKING PROPERTIES

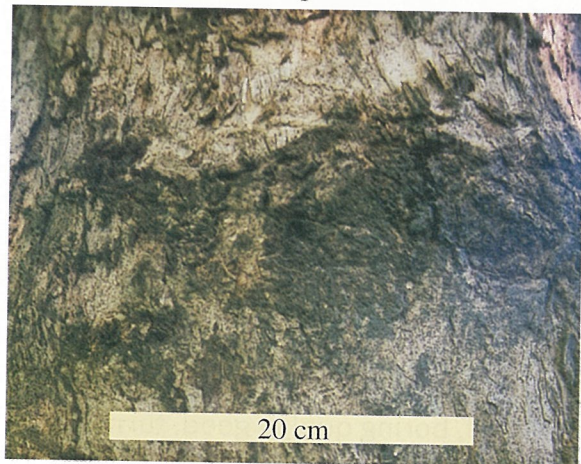
Saw fairly well, the timber works easily with hand and machine tools, finish with a smooth surface; good nailing and moderately boring properties; turning results fairly smooth; mortising satisfactory.

RECOMMENDED END USES

House building, furniture, panelling, interior finish, flooring.



Timber specimen

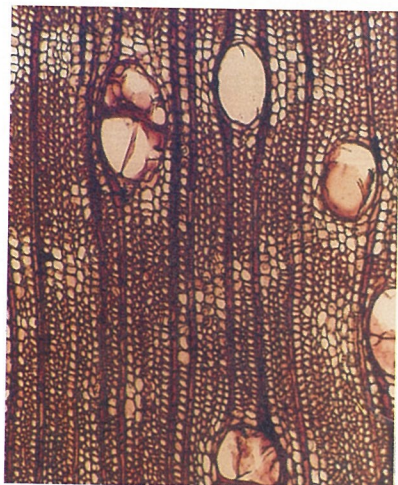


Bark



A plant in natural habit

Pyinma
Lagerstroemia speciosa (L.) Pers.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

SEIKCHI

Bridelia retusa (L.) Spreng.

FAMILY -Euphorbiaceae

HABIT

A large tree reaching a height of 26 m with trunk diameter of 0.5 to 0.8 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood light brown to greyish brown, sharply demarcated from greyish white to grey sapwood. Dull or slightly lustrous, interlocked-grained, texture medium and fairly even, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTIC

Average 36% solitary, radial multiples of 2 – 8, sometimes pore clusters, 6 – 32 per mm², 41– 164 (106) µm in diameter. Vessels consist of tyloses. Vessel length 187– 36 (450) µm. Intervessel pitting 2–6µm, opposite to alternate, vessel ray pitting 2 – 7 µm, alternate. Perforation plates simple. Fibres thick-walled, septate, with minute simple, slit-like pits in radial walls. Axial parenchyma vasicentric with uniseriate sheath, diffuse, diffuse in aggregate and 1 – 7 seriate terminal bands. Rays 1 – 4 (mostly 2 – 3) cells wide, 2 – 80 cells high, 5 – 10 per mm, heterocellular, consisting of procumbent cells with 1 to 3 rows of upright cells among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.58

STRENGTH GROUP C

DURABILITY - Moderately durable

TREATABILITY - Very difficult

SEASONING - Seasons slowly with almost no degrade.

Recommended Kiln Schedule:

- E (Proposed)

WORKING PROPERTIES

The wood saws and machines good, works well with both hand and machine tools, planes moderately good, nails well, boring quality good, turns fair, mortising properties satisfactory.

RECOMMENDED END USES

Panelling, interior finish, carts, agricultural implement, packing box, match box.



Timber specimen



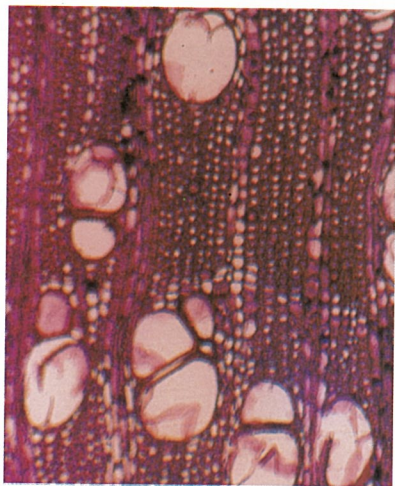
Bark



A plant in natural habit

Seikchi

Bridelia retusa (L.) Spreng.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

SHAW

Sterculia versicolor Wall.

FAMILY - Sterculiaceae

HABIT

A large tree reaching a height of 29 m with trunk diameter of 0.7 to 0.8 m, long, straight, heavily buttressed and deeply fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from white or greyish white sapwood. Lustrous, straight-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 60% solitary, radial multiples of 2 – 8 (mostly 2 – 3), 3 – 11 per mm², 82 – 277 (200) µm in diameter. Vessel length 328 – 502 (413) µm. Intervessel pitting 5 – 8 µm, opposite to alternate, vessel ray pitting 5 – 13 µm, alternate. Perforation plates simple. Fibres thin-walled, septate, with minute slit-like pits in both radial and tangential walls. Axial parenchyma vasicentric and diffuse in aggregate forming inconspicuous uniseriate bands. Rays 1 – 15 (mostly 8 – 10) cells wide, 4 – 163 cells high, 2 – 5 per mm, heterocellular, consisting of procumbent cells with two to five rows of upright cells on both sides and among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.35

STRENGTH GROUP E

DURABILITY - Perishable

TREATABILITY - Easy

SEASONING - Seasons very slowly without any degrade.

Recommended Kiln Schedule:

- C (Proposed)

WORKING PROPERTIES

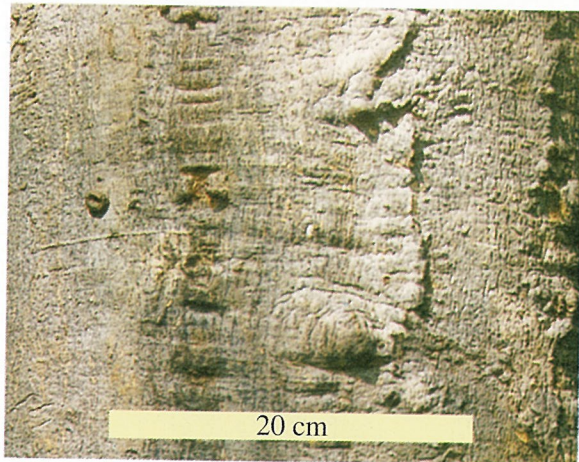
Easy to saw and works well with hand and machine tools, planes good, nailing and boring properties fairly good; a good turnery wood; mortising poor.

RECOMMENDED END USES

Packing box, match box, pencil wood.



Timber specimen



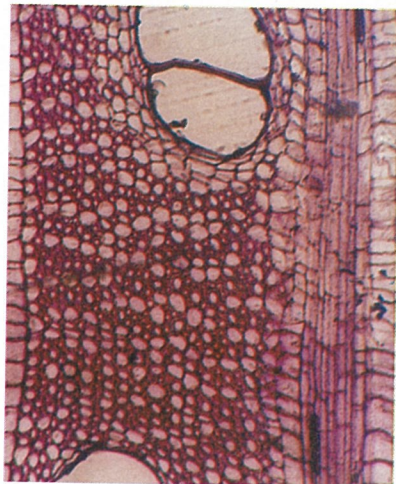
Bark



A plant in natural habit

Shaw

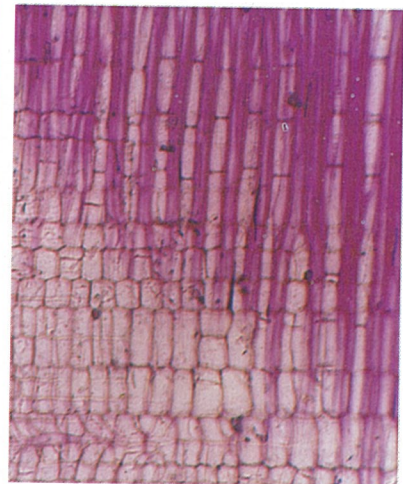
Sterculia versicolor Wall.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

SIT

Albizzia procera Benth.

FAMILY - Mimosaceae

HABIT

A large tree reaching a height of 38 m, with trunk diameter of 0.7 to 1.2 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood brown to reddish brown, sharply demarcated from yellowish white to light brown sapwood. Lustrous, straight-grained but sometimes interlocked-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 54% solitary, radial multiples of 2 – 6, sometimes pore cluster, 6 – 14 per mm², 51 – 277 (152) µm in diameter. Vessel pores contain gum deposits. Vessel length 226 – 472 (342) µm. Intervessel pitting 5 – 8 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, non-septate, very occasionally septate, with minute slit-like pits in radial walls. Axial parenchyma typically vasicentric, aliform and aliform confluent forming relatively long bands and diffuse. Prismatic crystals in 2 to 25 chambered axial parenchyma. Rays 1 – 4 (mostly 2 – 3) cells wide, 2 – 42 cells high, 6 – 14 per mm, homocellular, consisting of only procumbent cells.

BASIC SPECIFIC GRAVITY 0.72

STRENGTH GROUP B

DURABILITY - Durable

TREATABILITY - Difficult

SEASONING - Seasons very slowly with slight degrade.

Recommended Kiln Schedule: D

WORKING PROPERTIES

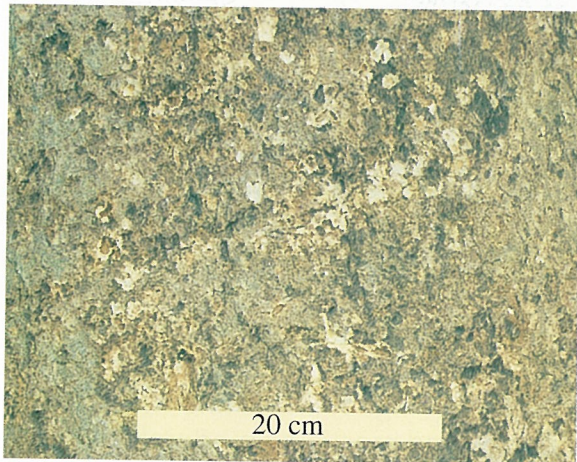
The wood saws and machines well, excellent in planing; nails and bores satisfactory, excellent in turning, mortising satisfactory.

RECOMMENDED END USES

Furniture, house building, flooring, decorative carving.



Timber specimen



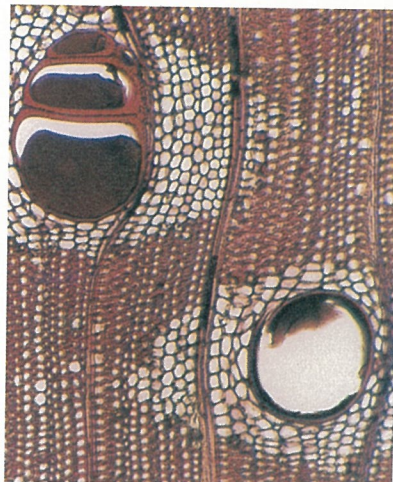
Bark



A plant in natural habit

Sit

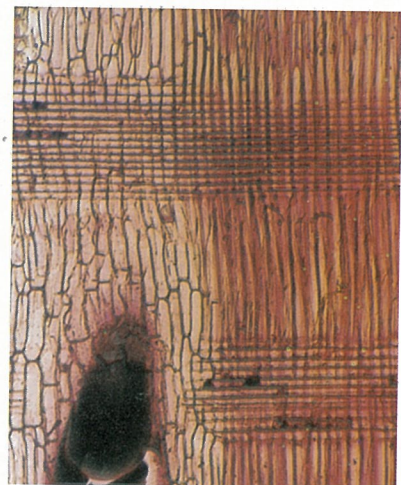
Albizia procera Benth.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

TAUKKYAN

Terminalia tomentosa W. & A.

FAMILY - Combretaceae

HABIT

A large tree reaching a height of 38 m with trunk diameter of 0.8 to 1.2 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood brown to dark brown or blackish brown with black streaks, sharply demarcated from the reddish white sapwood. Dull, straight-grained, texture coarse, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 61% solitary, radial multiples of 2 – 12, sometimes pore cluster, 3 – 15 per mm², 31 – 308 (196) µm in diameter. Vessel pores sometimes contain gum deposits. Vessel length 277 – 687 (447) µm. Intervessel pitting 2 – 15 µm, alternate, vestured, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thick-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma vasicentric, aliform and aliform confluent, diffuse and 1 – 4 seriate terminal bands. Axial parenchyma consists of crystals. Rays exclusively 1 (rarely 2) cells wide, 1 – 17 cells high, 8 – 17 per mm, homocellular, consisting of only procumbent cells. Rays parenchyma contain gum deposits.

BASIC SPECIFIC GRAVITY 0.82

STRENGTH GROUP C

DURABILITY - Durable

TREATABILITY - Moderately difficult

SEASONING - Seasons very slowly with slight degrade.

Recommended Kiln Schedule: D

WORKING PROPERTIES

The timber works rather difficult to saw, with hand and machine tools; planes fairly good, nails and bores poor; turning and mortising moderately good.

RECOMMENDED END USES

Furniture, cabinets, house building, flooring, veneers, plywood, panelling, interior finish, sleepers, agricultural implement, tool handles.



Timber specimen

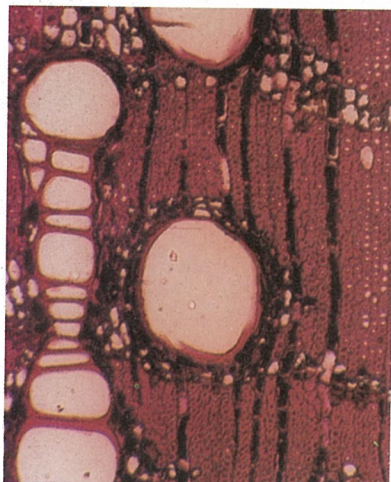


A plant in natural habit



Bark

Taukkyan
Terminalia tomentosa W. & A.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)

TAUNG-MEOK

Alstonia scholaris (L.) R.Br.

FAMILY - Apocynaceae

HABIT

A large tree reaching a height of 29 m, with trunk diameter of 0.5 to 1.2 m, long, straight, fluted stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood not sharply demarcated from pale yellow or whitish yellow sapwood. Lustrous, straight-grained, texture medium, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 35% solitary, radial multiples of 2 – 6, 2 – 14 per mm², 72 – 236 (159) µm in diameter. Vessel length 431 – 1057 (811) µm. Intervessel pitting 4 – 5 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thin-walled, non-septate, with minute slit-like pits in radial walls. Axial parenchyma 1 to 5 seriate tangential bands and diffuse in aggregate forming relatively long bands. Axial parenchyma contain crystals. Rays 1 – 3 (mostly 2 – 3) cells wide, 1 – 31 cells high, 5 – 11 per mm, heterocellular, consisting of procumbent cells with two to ten rows of upright cells among the procumbent cells.

BASIC SPECIFIC GRAVITY 0.39

STRENGTH GROUP E

DURABILITY - Non-durable

TREATABILITY - Very easy

SEASONING - Seasons very fast without degrade.

Recommended Kiln Schedule:

- C (Proposed)

WORKING PROPERTIES

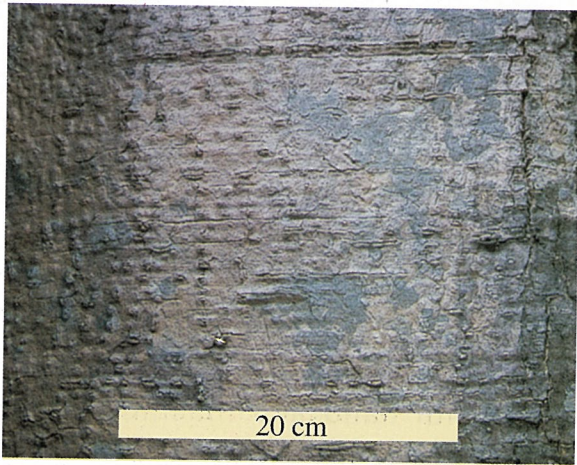
The timber saws well, easy to work by hand and machine tools, planes fairly good, nails and bores well, turning and mortising properties poor.

RECOMMENDED END USES

Packing box, match box, pencil wood.



Timber specimen

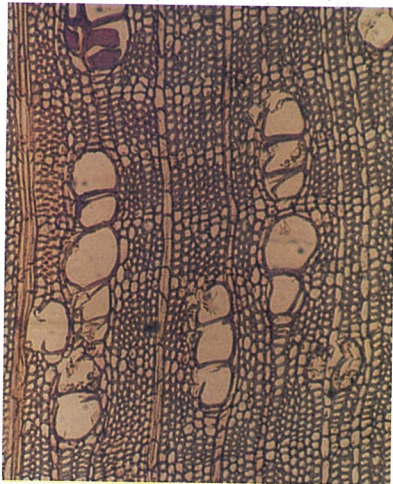


Bark

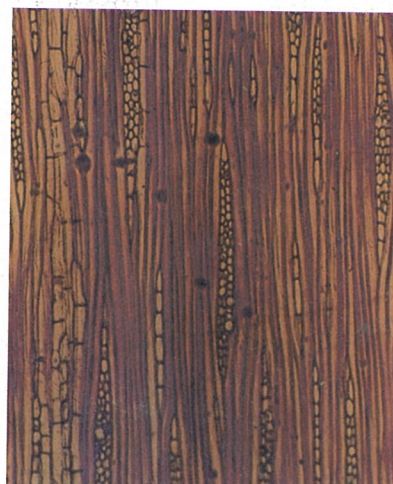


A plant in natural habit

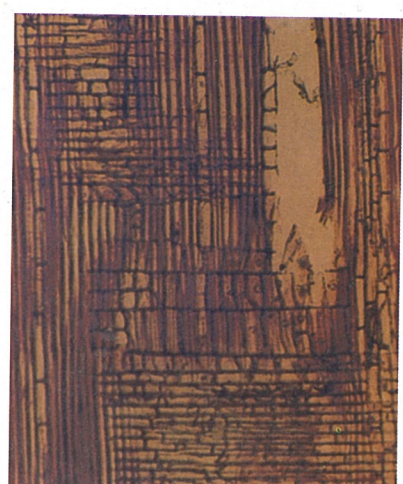
Taung-meok
Alstonia scholaris (L.) R.Br.



Transverse section (X 75)



Tangential longitudinal
section (X 75)



Radial longitudinal
section (X 75)

TAUNG-OKSHIT

Elaeocarpus spp.

FAMILY - *Elaeocarpaceae*

HABIT

A large tree reaching a height of 41 m, with trunk diameter of 0.7 to 0.8 m, long, straight, cylindrical stem.

GENERAL CHARACTERISTICS

Growth ring present, heartwood dark brown to greyish brown, sharply demarcated from white to greyish white sapwood. Lustrous, straight-grained but sometimes interlocked-grained, texture fine, without distinctive odour and taste, wood diffuse-porous.

MICROSCOPIC CHARACTERISTICS

Average 20% solitary, radial multiples of 2 – 4, occasionally pore clusters, 10 – 22 per mm², 21 – 153 (72) µm in diameter. Vessel length 235 – 1168 (657) µm. Intervessel pitting 3 – 5 µm, alternate, vessel ray pitting similar to intervessel pitting. Perforation plates simple. Fibres thick-walled, septate, with minute slit-like pits in radial walls. Axial parenchyma scanty and diffuse. Rays 1 – 6 (mostly 3 – 4) cells wide, 15 – 209 cells high, 9 – 15 per mm, heterocellular, consisting of procumbent cells with one to ten rows of upright cells on one side and among the procumbent cells. Ray parenchyma contains crystals and gum deposits.

BASIC SPECIFIC GRAVITY 0.69

STRENGTH GROUP B

DURABILITY - Durable

TREATABILITY - Average

SEASONING - Seasons very slowly with little degrade.

Recommended Kiln Schedule:
E (Proposed)

WORKING PROPERTIES

The wood saws well, works also easy with hand and machine tools, excellent in planing; nailing and boring properties well; also a good turnery wood, mortising satisfactory.

RECOMMENDED END USES

Packing box, match box.



Timber specimen

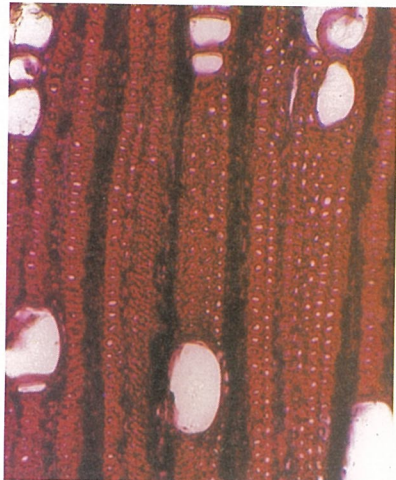


Bark



A plant in natural habit

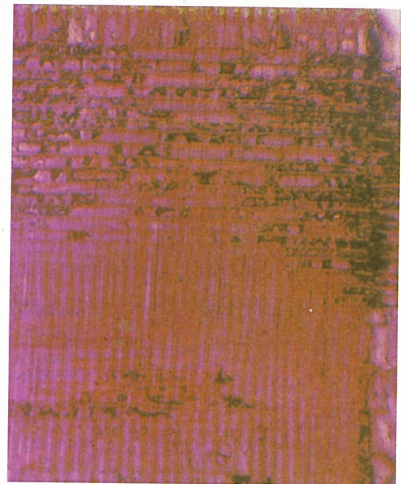
Taung-okshit
Elaeocarpus spp.



Transverse section (X 75)



Tangential longitudinal section (X 75)



Radial longitudinal section (X 75)