



# LUS Myanmar

ITTO PROJECT PD 31/96 REV.2(M.F.I)



**THE DATABASE SYSTEM**  
**ON**  
**MYANMAR'S LESSER USED TIMBER SPECIES**

**LUS MYANMAR**  
**VERSION 01**

# **USER MANUAL**

Introducing Myanmar's Lesser Used Timber Species  
To The World Market

Forest Department  
Ministry of Forestry  
Union of Myanmar  
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## **1. Instruction**

### **1.1 A Brief View**

LUS is a computer database system used for the identification, properties and utilization of woods from Myanmar. This is a research project jointly sponsored by International Tropical Timber Organization (ITTO) and Ministry of Forestry, Forest Department, Myanmar from 1997 to year 2000.

The purpose of database designed is to make users to understand the lesser used timber species in Myanmar. The USER MANUAL is designed to give a general introduction over the system, show an outline of the structure and contact of the database how to use this system.

The LUS database currently contains the information for fifty four lesser used timber species from Myanmar. The data recorded in the database includes species names, timber properties, anatomical features, end-uses, tree images and anatomy images of wood as well.

### **1.2 Main Functions of the System**

The system includes the following main functions:

- 1) Search wood species in the database by selection species names, timber properties, wood anatomical features, end-uses, geographical locations and distribution.
- 2) Display selected wood species with its detail information.
- 3) Print wood lists with detail information of selected species.
- 4) View the tree image and anatomical image of wood species recorded in the database.

### **1.3 System Requirements**

In order to run the *LUS Myanmar Ver. 1.0* software, an IBM compatible personal computer is required.

#### **Hardware Requirements**

- Pentium MMX processor or better (Pentium II recommended)
- 32 MB RAM (64 MB or more recommended)
- 600 MB or more free hard disk space
- CD-ROM or DVD Drive is required
- Colour VGA monitor (800 x 600 or more recommended)
- Mouse & Keyboard
- Standard printer (Laser or InkJet Printer)

#### **Software Requirements**

- Microsoft Windows 9x/Me/NT/2000/XP
- Microsoft Access 2000 or above

## 2. Database Contents

There are totally fifty four lesser used timber species from Myanmar in the database currently. The information of the data recorded in the database includes species names, timber properties, anatomical features, end-uses, location, distribution, tree images and anatomy images of wood, and so on.

### 2.1 Species Names

LUS Myanmar database describes each species with three kinds of names, which are:

- 1) Botanical name or Latin name
- 2) Family name
- 3) Local name or vernacular name

### 2.2 Wood Properties

The features of wood properties in the database are classified into seven categories and twenty features totally, which are defines as following :

1. Habit of tree
2. Physical properties include
  - i) colour between heartwood and sapwood
  - ii) heartwood colour
  - iii) odour
  - iv) grain
  - v) texture
  - vi) weight
  - vii) shrinkage
3. Wood mechanical properties refer to strength class
4. Wood seasoning includes air drying rate
5. Wood nature durability contains

- i) Natural durability
- ii) Resistance to termites
6. Amenability to preservative treatment
7. Wood working properties includes
  - i) Hand working
  - ii) Machine working
  - iii) Saw
  - iv) Nailing
  - v) Boring
  - vi) Turnery
  - vii) Mortise

### 2.3 Anatomical Features

The wood anatomical features defined in the database can be divided into eight categories related to thirty four features, which are:

1. **Growth rings:** Growth ring boundaries
2. **Vessels/Pores:** Porosity, Arrangement, Vessels groupings, Solitary vessel outline, Perforation plates, Intervessel pits, Vestured pits, Vessel-ray pitting, Mean tangential diameter of vessels lumina, Vessel No/ sq.mm, Mean vessels element length, Tyloses and deposits
3. **Fibres or fibre trachids:** Pits, Septate fibers, Helical thickenings, Mean lengths, Wall thickness
4. **Tracheids**
5. **Axial parenchyma:** Aportracheal parenchyma, Paratracheal parenchyma, Banded parenchyma
6. **Rays:** Rays of two distinct sizes, Ray width, Rays per millimetre, Homogeneous rays, Heterogeneous rays, Sheath cells, Tile cells, Radial intercellular canals
7. **Mineral inclusions:** Crystal shape, Crystals present, Crystalliferous cells, Silica bodies present
8. **Miscellaneous:** Storied Structure

## 2.4 Uses

The uses mean end-uses of wood and are recorded in 35 categories, described as following;

- 1) Agricultural implement
- 2) Axe-handles
- 3) Boxes
- 4) Building
- 5) Cabinets
- 6) Cart
- 7) Carving
- 8) Cheap furniture
- 9) Chisel handles
- 10) Combs
- 11) Crates
- 12) Decorative carving
- 13) Decorative panelling
- 14) Door and window frames
- 15) Drums
- 16) Flooring
- 17) Furniture
- 18) House building
- 19) Household appliances
- 20) Interior finish
- 21) Joinery
- 22) Match box
- 23) Musical instruments
- 24) Packing box
- 25) Panelling
- 26) Pencil wood
- 27) Planking
- 28) Plywood



- 29) Sleepers
- 30) Sleepers interior finish
- 31) Staircase components
- 32) Tool handles
- 33) Toys
- 34) Turnery
- 35) Veneers

## 2.5 Location

The location here refers to the geographic distribution of the species, which is described in term of its known occurrence in Myanmar. The forest inventory covered one state and six divisions out of fourteen states and division in Myanmar. These are : (i) Sagaing division, (ii) Mandalay division, (iii) Yangon division, (iv) Magway division, (v) Bago division, (vi) Ayarwaddy division and (vii) Rakhine state.

## 2.6 Distribution

The distribution here represents detailed composition of tree species by forest types. These are : (i) Evergreen forest typical, (ii) Evergreen forest giant, (iii) Evergreen forest riverine, (iv) Mixed deciduous forest upper moist, (v) Mixed deciduous forest lower, (vi) Mixed deciduous forest upper dry, (vii) Dry forest thorn, (viii) Dry forest than-dahat, (ix) Dipterocarp (indaing) forest high, (x) Dipterocarp (indaing) forest low, (xi) Bamboo and (xii) Swamp.

## 2.7 Trees Images

The three images in photos of a plant in natural habit, bark and timber specimem are mentioned for each species in the database.

## 2.8 Anatomy Images

The three wood anatomical images in different direction of wood cutting,

transverse, tangential & longitudinal and radial & longitudinal, are provided for each species in the database. The images were under the microscope and come from three directions in term of the cross, tangent and radial of a species sample.

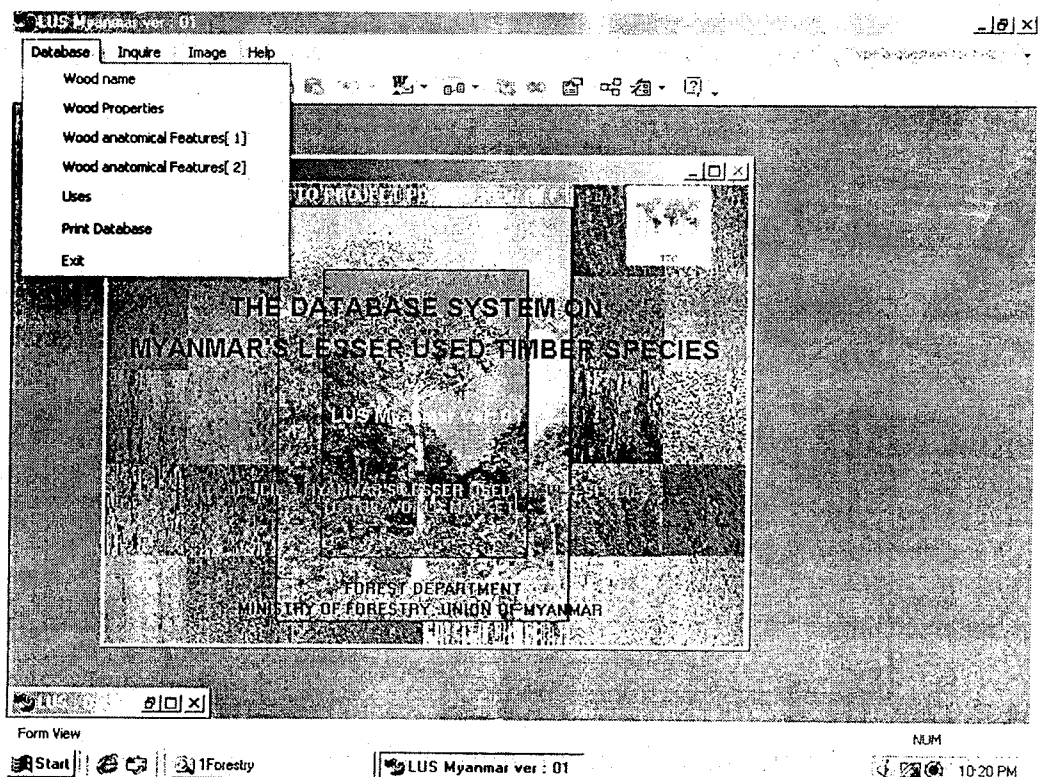
### 3. Operating Guide

#### 3.1 Running LUS Myanmar Ver. 01

LUS Myanmar is a Windows application program which can be run under Windows 9x/Me/NT/2000/XP or above version and Microsoft Access 2000 or above version.

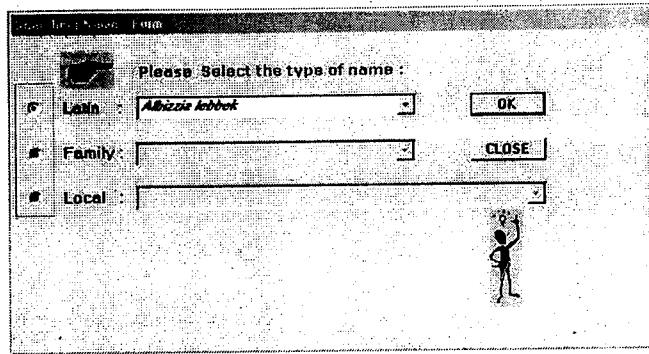
- Insert the LUS Myanmar CD in your CD-ROM Drive.
- Please wait while installing the program in MS-DOS mode.
- Double-click the My Computer icon.
- Double-click the LUS icon in (C:\LUS\_Mya\), to start the application.

#### 3.2 Main Screen



There are Four pull down menus, Database, Inquire, Image, Help, on the system main screen.

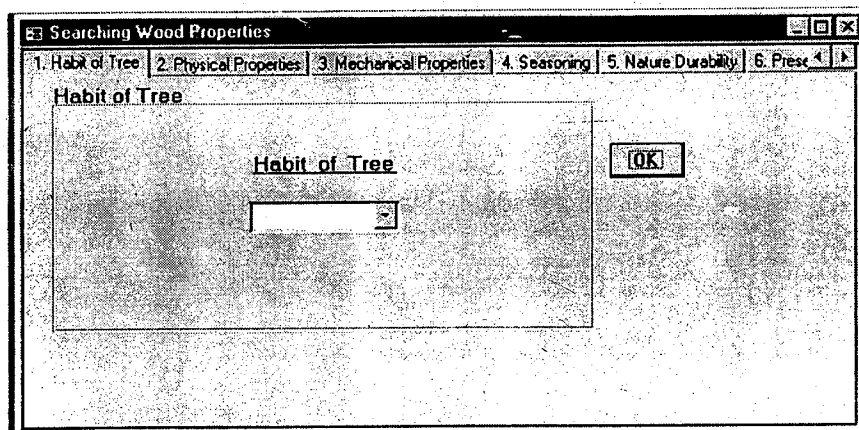
### 3.3 Search by Species Names



Click Inquire menu → From Name command.

In this section, the system allows users to select a kind of species name, latin, family, local name from the name list on the dialog box, and then choose or type the name you wanted. When you finished, click OK button. Accordingly, computer will search and show the detail information about the species selected.

### 3.4 Search by Wood Properties

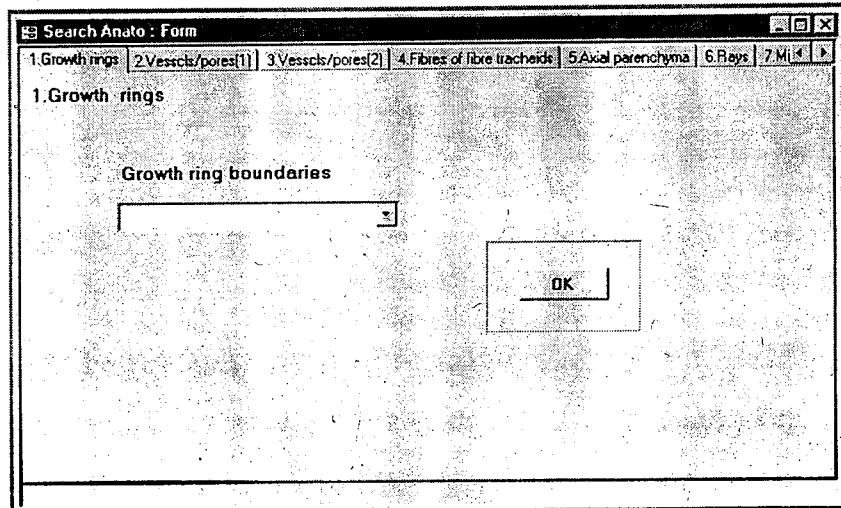


Choose Inquire menu → From Properties → Wood Properties command.

The user can focus on specific properties of a timber. All the properties selection to the species are listed on the dialog box. There are totally seven

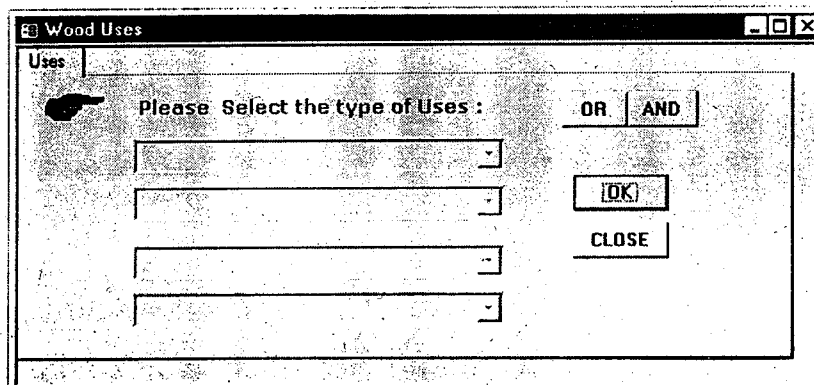
section tabs and from this sections you can search the wood properties by selecting or typing the name of properties. Before searching with Physical properties, Nature durability, and Working properties, the logical relationship between the properties selected must be decided first. By selecting or typing the properties's options the system will search and find the species matched with the properties selected. See the window below.

### 3.5 Search by anatomical features



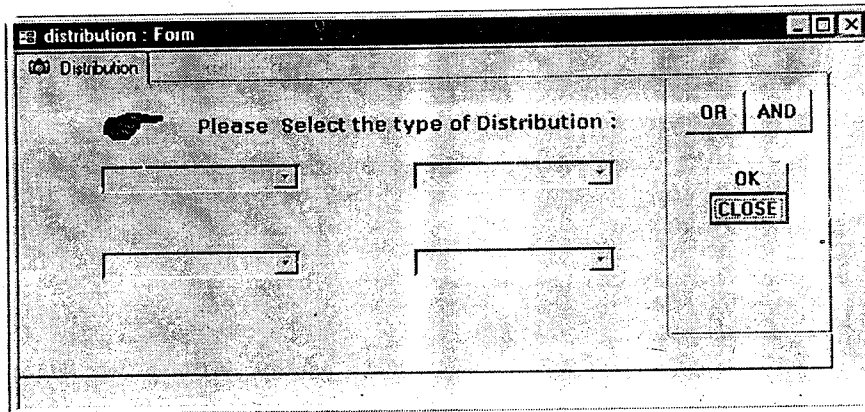
In this section, the users can focus on specific features of wood. Eight section tabs of wood anatomical features are displayed on the dialog box. The same operation described in last section, firstly deciding relationship, then selecting or typing the features you want, the system will search and find the species matched with the user's selections.

### 3.6 Search by Uses



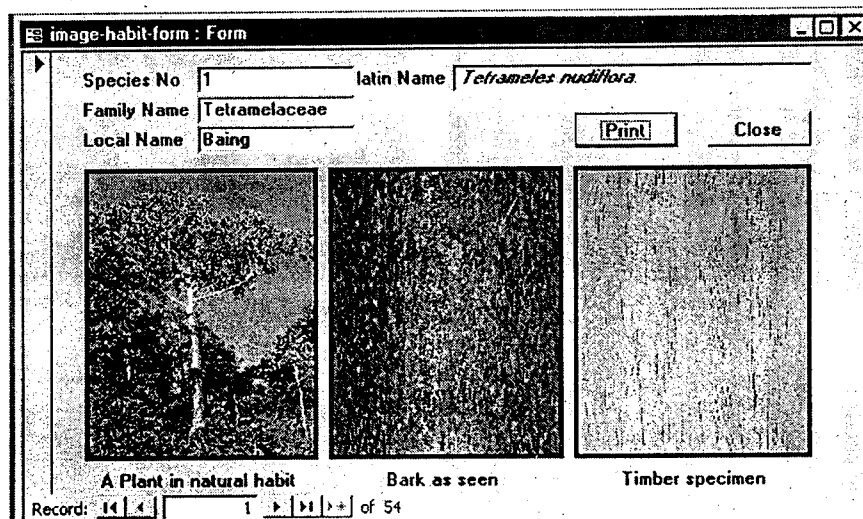
In this section, the users can focus on wood uses. The same operation like firstly deciding relationship, and then selecting or typing the features you want, the system will search and find the species matched with the user's selections.

### 3.7 Search by Distributions



If you want to find species growing in some regions, go this function. The operation like before, where firstly deciding relationship, and then selecting or typing the features you want, the system will search and find the species matched with the user's selections.

### 3.8 Displaying and printing the image of Tree features

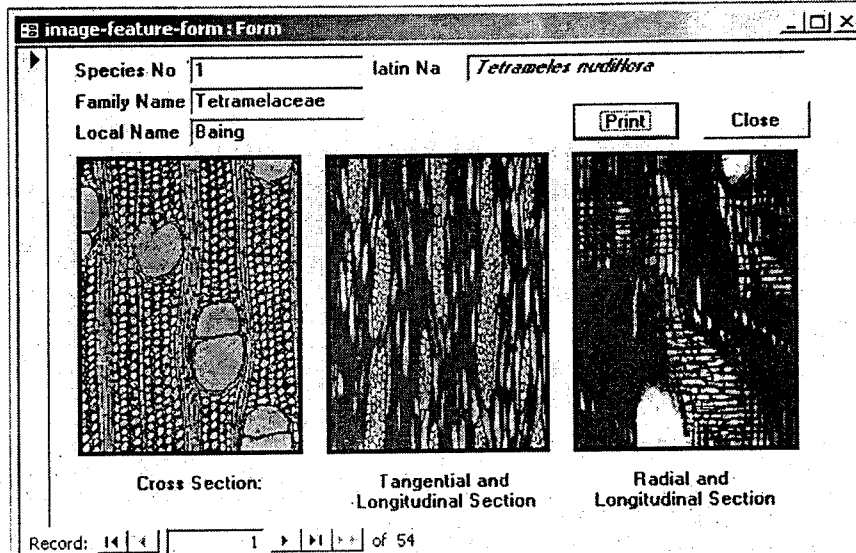


In this section, the users can view the image of tree features in photos of a plant in natural habit, bark as seen and timber specimen. Moreover, you



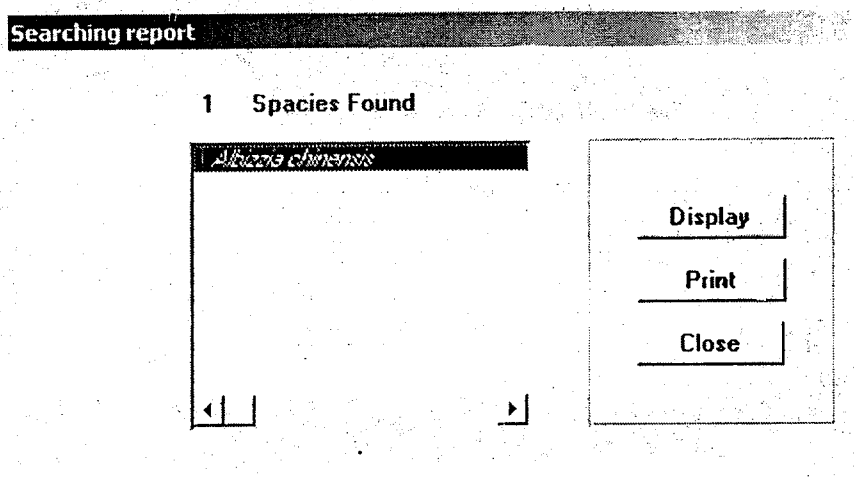
can also print the image of tree features by clicking the print button on the dialog box. After that click the close button to return to main menu.

### 3.9 Displaying and printing the image of Anatomical features

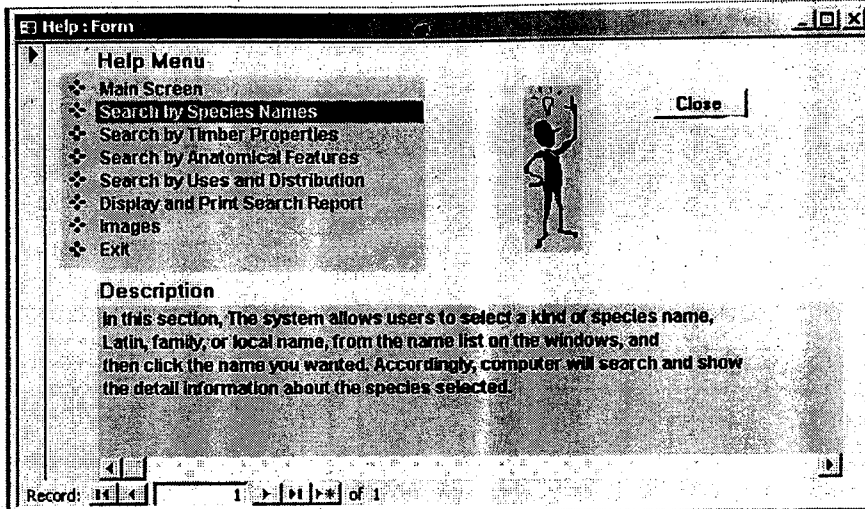


As describe in the above section, this section also display the image of anatomical features with cross section, tangential section and radial section. You can print the image of anatomy features by clicking the print button on the dialog box. And click close button to go back to main menu.

### 3.10 Display and Print Search Report



### 3.11 Use system Help Information

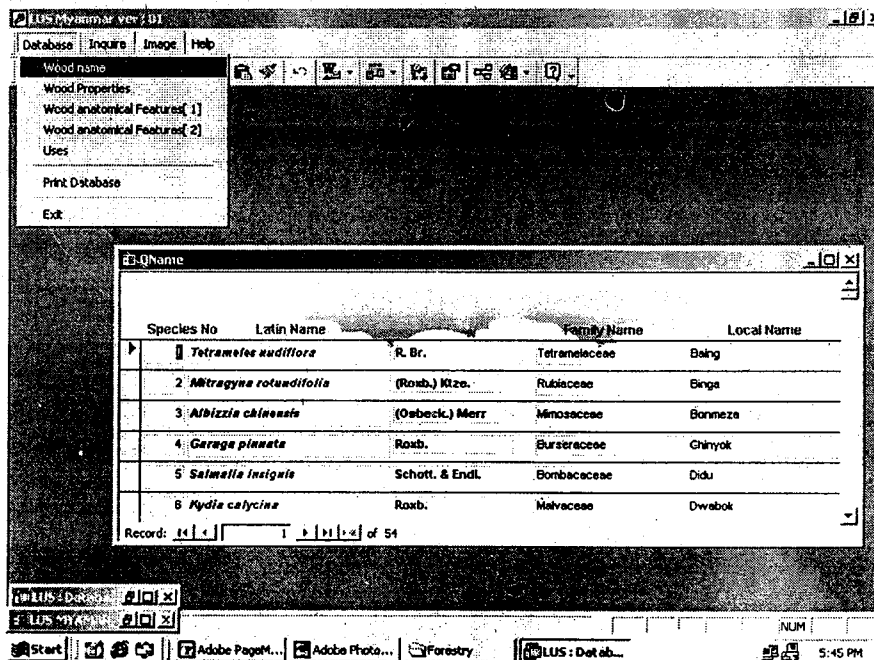


### 3.12 Database Menu

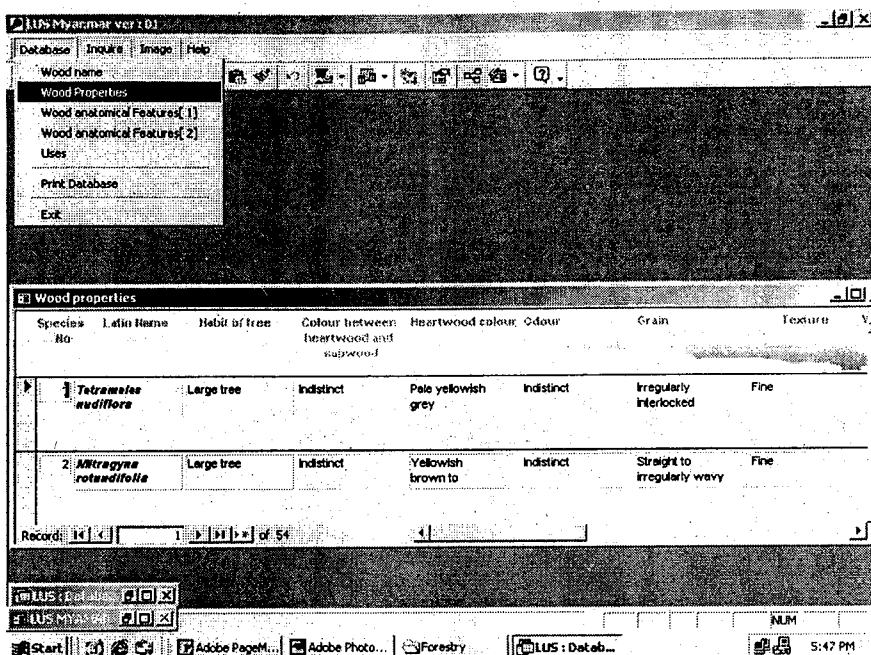
You can view all species by Wood Name, Wood Properties, Anatomical Features (1), Anatomical Features (2) and Uses.

You can also print database by the range of Species No.

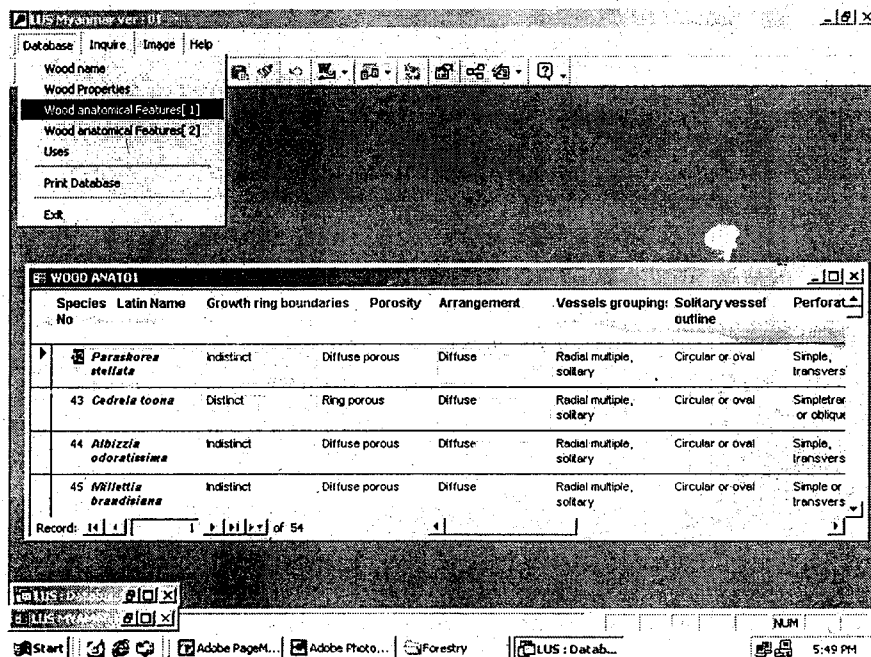
#### 3.12.1 Wood Name



### 3.12.2 Wood Properties



### 3.12.3 Anatomical Features (1)



### 3.12.4 Anatomical Features (2)

Name	Wall thickness	Apotracheal parenchyma	Paratracheal parenchyma	Banded parenchyma
<i>Parashorea atollata</i>	Thick	Diffuse, diffuse in	Vasicoentric, aliform, aliform	Relatively long tangential
43 <i>Cadreia toona</i>	Thin	Diffuse	Scarify, vasicoentric	1 - 6 seriate terminal bands
44 <i>Albizzia odoratissima</i>	Thick	Diffuse	Vasicoentric, aliform	Absent

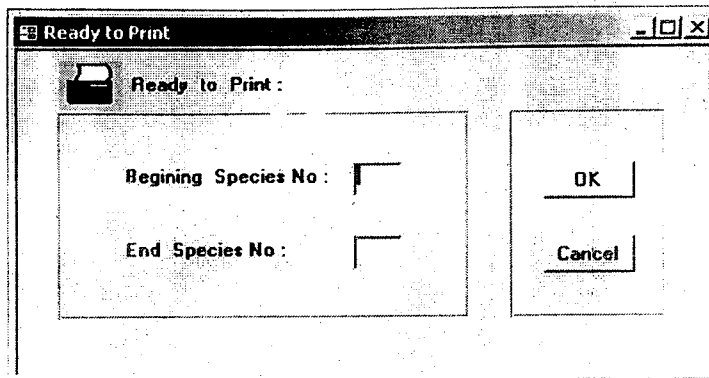
Record: 14 | 1 | 1 | 1 | 2 | of 54

### 3.12.5 Uses

Species No	Latin Name	Uses
1	<i>Tetrameles nudiflora</i>	Packing box, match box, toys.
2	<i>Abragyna rotundifolia</i>	Furniture, turnery, chisel handles, house building, panelling, interior finish, door end
3	<i>Albizzia chinensis</i>	Household appliances, musical instruments, turnery wood, packing box.
4	<i>Garuga pinnata</i>	Packing box, match box, drums, house building, musical instruments.
5	<i>Salmalia insignis</i>	Packing box, match box, toys, musical instruments.
6	<i>Kydia calycina</i>	Packing box, match box, pencil wood.

Record: 14 | 1 | 1 | 1 | 2 | of 54

### 3.12.6 Print Database



### 3.12.7 Exit

To Exit the LUS Myanmar Ver: 01 Application.



#### 4. Contact Address

The system was developed by Forest Research Institute, Yezin under support ITTO (International Tropical Timber Organisation) and Myanmar Government.

Contact address :

- Director  
Forest Research Institute Branch Office  
Gyogone, Yangon  
Myanmar.

Tel : 095-01-664457 -

Fax : 095-01-664336 -  
095-01-665592

E-mail : Teaknet@mptmail.net.mm

- Director  
Forest Resecrch Institute  
Yezin, Myanmar.

Tel : 095-067-21601

Fax : 095-067-21601

## 5. Appendices

## Appendix 1. List of Species

No	Latin Name	Family Name	Local Name
1	<i>Tetrameles nudiflora</i> R. Br.	Tetramelaceae	Baing
2	<i>Mitragyna rotundifolia</i> (Roxb.) Ktze.	Rubiaceae	Binga
3	<i>Albizia chinensis</i> (Osbeck.) Merr.	Mimosaceae	Bonmeza
4	<i>Garuga pinnata</i> Roxb.	Burseraceae	Chinyok
5	<i>Salmalia insignis</i> Schott. & Endl.	Bombacaceae	Didu
6	<i>Kydia calycina</i> Roxb.	Malvaceae	Dwabok
7	<i>Eriolaena candollei</i> Wall.	Sterculiaceae	Dwani
8	<i>Spondias pinnata</i> (L.) Kz.	Anacardiaceae	Gwe
9	<i>Schleichera oleosa</i> (Lour.) Merr.	Sapindaceae	Gyo
10	<i>Antiaris toxicaria</i> (Pers.) Lesch.	Moraceae	Hmyaseik
11	<i>Adina cordifolia</i> Hk.f.	Rubiaceae	Hnaw
12	<i>Albizia lebbek</i> Benth.	Mimosaceae	Kokko
13	<i>Hymenodictyon excelsum</i> Wall.	Rubiaceae	Kuthan
14	<i>Vitex peduncularis</i> Wall.	Verbenaceae	Kyetyo
15	<i>Terminalia pyrifolia</i> Kz.	Combretaceae	Lein
16	<i>Salmalia malabarica</i> (DC) Schott & Endl.	Bombacaceae	Letpan
17	<i>Lagerstroemia tomentosa</i> Presl.	Lythraceae	Leza
18	<i>Anthocephalus cadamba</i> Miq.	Rubiaceae	Ma-u-lettan-she
19	<i>Homalium tomentosum</i> Benth.	Flacourtiaceae	Myaukchaw
20	<i>Duabanga grandiflora</i> (Roxb.) Walp.	Lythraceae	Myaukngo
21	<i>Myristica</i> spp.	Myristicaceae	Myauk-thwe-gyi
22	<i>Myristica angustifolia</i> Roxb.	Myristicaceae	Myauk-thwe-the
23	<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	Nabe
24	<i>Terminalia chebula</i> Retz.	Combretaceae	Panga
25	<i>Haplophragma adenophyllum</i> (Wall.) Dop.	Bignoniaceae	Petthan
26	<i>Holoptelea integrifolia</i> Planch.	Ulmaceae	Pyaukseik
27	<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae	Pyinma
28	<i>Bridelia retusa</i> (L.) Spreng.	Euphorbiaceae	Seikchi
29	<i>Sterculia versicolor</i> Wall.	Sterculiaceae	Shaw
30	<i>Albizia procera</i> Benth.	Mimosaceae	Sit

31	<i>Terminalia tomentosa</i> W. & A.	Combretaceae	Taukkyan
32	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Taung-meok
33	<i>Elaeocarpus</i> spp.	Elaeocarpaceae	Taung-okshit
34	<i>Artocarpus chaplasha</i> Roxb.	Moraceae	Taung-peinne
35	<i>Pterospermum acerifolium</i> (L.) Willd.	Sterculiaceae	Taung-petwun
36	<i>Swintonia floribunda</i> Griff.	Anacardiaceae	Taung-thayet
37	<i>Mangifera</i> spp.	Anacardiaceae	Taw-thayet
38	<i>Eugenia</i> spp.	Myrtaceae	Thabye
39	<i>Protium serratum</i> Engler.	Burseraceae	Thadi
40	<i>Stereospermum personatum</i> Chatt.	Bignoniaceae	Thande
41	<i>Ficus</i> spp.	Moraceae	Thapan
42	<i>Parashorea stellata</i> Kz.	Dipterocarpaceae	Thingadu
43	<i>Cedrela toona</i> Roxb.	Meliaceae	Thitkado
44	<i>Albizzia odoratissima</i> (L.f.) Benth.	Mimosaceae	Thit-magyi
45	<i>Millettia brandisiana</i> Kz.	Papilionaceae	Thit-pagan
46	<i>Nauclea sessilifolia</i> Roxb.	Rubiaceae	Thit-payaung
47	<i>Terminalia bellerica</i> Roxb.	Combretaceae	Thit-sein
48	<i>Schrebera swietenoides</i> Roxb.	Oleaceae	Thit-swele
49	<i>Gmelina arborea</i> Roxb.	Verbenaceae	Yemane
50	<i>Dalbergia cultrata</i> Grah.	Papilionaceae	Yindaik
51	<i>Chukrasia tabularis</i> A. Juss.	Meliaceae	Yinma
52	<i>Dalbergia fusca</i> Pierre.	Papilionaceae	Yinzat
53	<i>Anogeissus acuminata</i> Wall.	Combretaceae	Yon
54	<i>Lagerstroemia villosa</i> Wall.	Lythraceae	Zaungbale

# **A Sample Worksheet**



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**THE DATABASE SYSTEM ON  
MYANMAR'S LESSER USED TIMBER SPECIES WOOD DATABASE REPORT**



Species No : 11  
Latin Name : *Adina cordifolia*  
Family Name : Rubiaceae  
Trade Name :  
Local Name : Hnaw

**Wood Properties**

Habit of tree : Large tree

**Wood physical Properties :**

- Colour between heartwood and sapwood : Indistinct
- Heartwood colour: Yellowish to reddish brown
- Odour :: Indistinct
- Grain : Fairly straight
- Texture : Very fine
- Weight (Kg/ cubic m, air dry) : 713
- Shrinkage (% tangential): 6.5

**Wood mechanical properties :**

- Strength class : C

**Wood seasoning :**

- Air drying rates : Slow

**Wood nature durability :** Moderately durable

**Wood resistance to termites :** Non-resistant

**Amenability to preservative treatment :** Average

**Forest type** Evergreen (typical), Mixed deciduous forest (upper dry), Mixed deciduous forest (upper moist), Mixed deciduous forest (lower), Dry forest (than-dahat), Dry forest (thorn), Dipterocarp (Indaing forest, high)

**Distribution** Sagaing, Magway, Mandalay, Bago, Ayeyawady, Rakhine

<b>Hand working</b>	Easy	<b>Mechine working</b>	Easy
<b>Saw</b>	Easy	<b>Nailing</b>	Moderate
<b>Boring</b>	Poor	<b>Turnery</b>	Moderate
<b>Mortize</b>	Moderate		





ITTO



## Wood Structure

### Growth ring boundaries

- Growth ring boundaries : Indistinct

### Vessels/pores :

- Porosity : Diffuse porous
- Vessels groupings Radial multiples, solitary
- Arrangement Diffuse
- Solitary vessel outline Circular or oval
- Perforation plates Simple, transverse or oblique
- Intervessel pits Alternate to opposite
- Vestured pits Absent
- Vessel-ray pitting Alternate
- Helical thickenings Absent
- Mean T.D of vessel lumina ( $\mu\text{m}$ ) 54
- Vessel No/ sq.mm 41 - 59
- Mean vessel element length ( $\mu\text{m}$ ) 796
- Tyloses and deposits Absent
- Wood vesselless

### Fibres or fibre tracheids:

- Pits Slit-like
- Septate fibres Absent
- Fibre helical thickenings Absent
- Mean lengths ( $\mu\text{m}$ ) 1657
- Wall thickness Thin

Tracheids Absent

### Axial parenchyma

- Apotracheal parenchyma Diffuse, diffuse in aggregate
- Paratracheal parenchyma Scanty
- Banded parenchyma Absent
- Absent axial parenchyma

### Rays:

- Interconnected rays Absent
- Aggregate rays Absent
- Rays of two distinct sizes Absent
- Ray width 1 - 2 cells
- Rays per millimetre 9 - 19



THE DATABASE SYSTEM ON  
MYANMAR'S LESSER USED TIMBER SPECIES WOOD DATABASE REPORT



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- 
- |  |         |
|--|---------|
| -Homogeneous rays                            | Absent  |
| -Heterogeneous rays                          | Present |
| -Sheath cells                                | Absent  |
| -Tile cells                                  | Absent  |
| -Radial intercellular canals and laticifers: | Absent  |

**Mineral Inclusions :**

- |                         |        |
|-------------------------|--------|
| - Crystal shape         |        |
| - Crystal present       |        |
| - Crystalliferous cells | Absent |
| - Silica bodies present |        |

**Others:**

- |                             |        |
|-----------------------------|--------|
| storied structure           | Absent |
| Oil and/or mucilage cells : | Absent |
| Axial intercellular canals: | Absent |

**Wood uses**

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

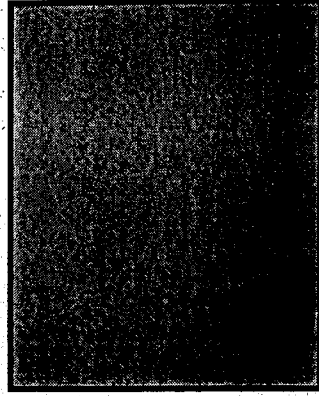
Species No  latin Name   
Family Name   
Local Name



A Plant in natural habit

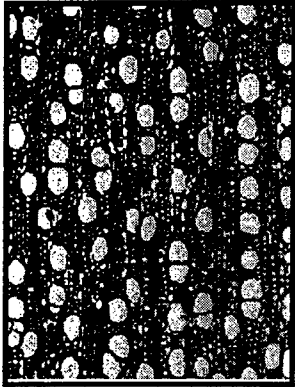


Bark as seen

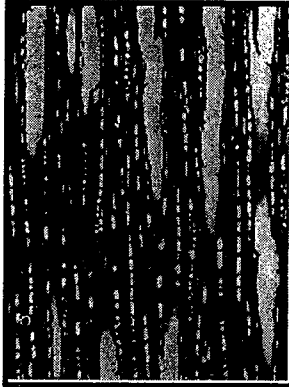


Timber specimen

Species No 11 latin Name *Adina cordifolia*  
Family Name Rubiaceae  
Local Name Hnaw



Cross Section:



Tangential and  
Longitudinal Section



Radial and  
Longitudinal Section



