

INFORMATION LEAFLET  
FOREIGN WOODS

Forest Products Laboratory,<sup>1</sup> Forest Service  
U. S. Department of Agriculture  
1953

-----  
PYINKADO  
PYINGADO

Xylia dolabriformis<sup>2</sup> Benth.  
(= Mimosa xylocarpa Taub.)  
Family: Leguminosae

-----  
By

ELOISE GERRY, Forest Products Technologist  
Division of Silvicultural Relations  
and  
JOHN T. DROW, Engineer  
Division of Timber Mechanics

-----  
Pyinkado occurs chiefly in Burma and is one of the most valuable Burmese timbers,  
second only to teak (5, 6, 13).<sup>3</sup>

Other vernacular names (6, 14) are:

Baja	Irummala	Konda	Pyin	Tangedu
Bajeh	Jamba	tangedu	Shilve	Tangudu
Eruvalu	Jambu	Kongora	Suria	Tirarba
Ironwood	Kada	Orjori	Tangani	Yerul
Irul		Pangali	Tangedi	

---

<sup>1</sup>Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

<sup>2</sup>Xylia xylocarpa Taub. is found on the west coast of India (13) and is  
sometimes considered syn. X. dolabriformis.

<sup>3</sup>Underlined numbers in parentheses refer to the list of numbered references  
at the end of the article.

## The Tree

Pyinkado trees may grow very large, 100 to 120 feet in height and 8 to 12 feet in girth. At their best the boles are straight and fairly cylindrical. These trees grow in association with teak (6, 10, 13, 14). The trees occur in the lower hill forests in Burma up to about 2,500 feet (14).

## Bark

The bark may contain as much as 14 percent of tannin (14).

## The Wood

### Color

The sapwood is pale yellowish or reddish-white to light brown and narrow. The heartwood is uniform reddish-brown with few markings, but may be faintly veined with darker lines. It darkens with age (2, 13).

### Grain, Texture

The grain is straight, wavy, or broadly interlocked, and the texture is medium.

### Weight

The wood is heavy; too heavy to float, up to 80 pounds per cubic foot or more when green (2, 6, 14, 15). At 12 percent moisture content it weighs 57 to 64 pounds per cubic foot; specific gravity about 1.00 (11, 13).

### Mechanical Properties

Pyinkado is one of the strongest and hardest of Indian and Burmese timbers (6, 10, 11, 13, 15). It is similar in properties to Burma teak, but harder.

The values in table 1 represent average properties of pyinkado as determined in India (11) and the results of these tests are compared with data for white oak from the United States.

### Workability

The wood is very difficult to work in the dry condition, but it is possible to obtain a smooth surface that will take a high polish. It is considered best to convert freshly cut logs into timber at once. It is customary to box the heart when cutting railway ties (6, 13).

## Seasoning

Pyinkado has been rated as difficult to season (12), but it is thought to give less trouble in splitting than the Xylia xylocarpa of the west coast of Burma. The British Forest Products Research Laboratories recommended (1952) their Schedule 3 for kiln drying 4/4 stock. The U. S. Forest Products Laboratory schedule (16) that corresponds to this, generally, during the first part of kiln drying is T4-D2. Shrinkage data are given in table 1.

## Durability

Pyinkado is extremely durable, rated as the most durable timber with respect to decay found in India (13). Untreated ties have lasted 20 to 24 years and more in service. It is not immune, however, from insect and termite attack (6).

## Uses

Pyinkado is an excellent construction wood for house posts, bridges, piles, poles, flooring, and planking, and is used for railway ties because of its natural durability. It is also used for tent pegs, cart wheels, tool handles, and boatbuilding (6, 13).

## Supplies

Very large supplies of pyinkado are reported available in Burma. Squares up to 40 feet by 16 by 16 inches have been available in quantity (13, 14).

## Structure

Growth rings.--The growth rings are present, but not always distinct (7).

The pores.--The pores or vessels are quite uniformly scattered (2), but they vary in size, being large (though barely visible without magnification), medium size, and small (13).

Rays.--The rays are not visible without magnification.

Gum.--Some vessels contain an orange-brown oily gum that gives a sticky feeling to the touch. Rarely, white deposits also are present (6, 7, 13).

Tyloses.--Small tyloses may occur.

## References

1. Boulger, G. S.  
1908. Wood. 2nd Ed., p. 123. E. Arnold, London.
2. Chowdhury, K. A.  
1945. Identification of Burma Commercial Timbers. Illus.  
Ind. For. Rec. 3(6):1-27 (20).
3. Couffinhal, M.  
1918. Foret Cochin-China Tab. A. IV. Bul. No. 8. Saigon.
4. Foxworthy, F. W.  
1909. Indo-Malayan Woods. P. 463. Phil. Jour. Sci., Sec. C.  
Vol. IV, No. 4, Manila.
5. Gamble, J. S.  
1922. Manual of Indian Timbers. P. 285. Sampson Low, Marston  
and Co., Ltd., London.
6. Howard, A. L.  
1948. Timbers of the World. 3rd Ed.:500-504. Macmillan, London.
7. Johnston, D. R.  
1952. Structure Drawings of Specimen Woods, (Pyinkado). Wood (Brit.)  
Vol. 17, No. 12, p. 475, Dec.
8. Kanehira, R.  
1924. Anatomical Notes. Indian Woods. Formosa.
9. Lecomte, Henri  
Bois Indo-China. P. 68. Pub. de L'Agence Economique 13, Paris.
10. Limaye, V. D.  
1946. Safe Working Stresses for Indian Timbers, Indian Forest  
Records (N.S.), Utilization, Vol. 4, No. 1, 31 pp.  
Dehra Dun, U.P., India.
11. \_\_\_\_\_, and Seaman, L. N.  
1933. Physical and Mechanical Properties of Woods Grown in India  
(Third Interim Report on Project I: Tests on Small Clear  
Specimens), Indian Forest Records Vol. 18, Part 10, P. 16.
12. Pearson, R. S.  
1912. Commercial Guide to Forest Economic Products of India. 107.  
Calcutta.
13. Pearson, R. S., and Brown, H. P.  
1932. Commercial Timbers of India. Calcutta. Pp. 429-434.

14. Rodger, A.  
1951. Forest Products Burma. (Reprinted 1921) Govt. Printing.  
Rangoon.
15. Scott, C. W.  
1931. A comparison of the timbers of Burma with those of Europe  
and America as regards strength and other properties.  
Paper No. 3, Assoc. of Engineers in Burma, pp. 1-17.  
Rangoon.
16. Torgeson, O. W.  
1951. Schedules for Kiln Drying of Wood. U. S. Forest Products\*  
Laboratory. Madison, Wis. Report No. D1791 (Available on  
request).
17. Troup, R. S.  
1909. Indian Woods and Their Uses, Indian Forest Memoirs, P. 270,  
Vol. 1, Economic Products Series No. 1. Calcutta.
18. \_\_\_\_\_  
1921. Silviculture of Indian Trees. ii, p. 402. Clarendon Press,  
Oxford, England.

Table 1

	Pyinkado <sup>1</sup> ( <i>Xylia dolabriformis</i> )		White Oak <sup>2</sup> ( <i>Quercus alba</i> )	
	Green <sup>3</sup>	Dry <sup>3</sup>	Green	Dry
Moisture content.....percent	49	12	68	12
Specific gravity				
Volume at test.....	0.78	0.81	0.60	0.68
Ovendry volume.....	0.87		0.71	
Shrinkage				
In volume -- green to ovendry.....percent	11.1		15.8	
Radial -- green to ovendry.....percent	3.3		5.3	
Tangential -- green to ovendry.....percent	6.7		9.0	
Static bending				
Fiber stress at proportional limit.....P.s.i.	9,600	11,200	4,700	8,200
Modulus of rupture.....P.s.i.	15,600	20,000	8,300	15,200
Modulus of elasticity.....1,000 P.s.i.	2,260	2,500	1,250	1,780
Work to proportional limit.....in.-lb. per cu. in.	2.43	2.95	1.08	2.27
Work to maximum load.....in.-lb. per cu. in.	14.9	16.7	11.6	14.8
Work, total.....in.-lb. per cu. in.	38.1	36.0	28.2	29.1
Impact bending -- 50-pound hammer				
Fiber stress at proportional limit.....P.s.i.	18,300	20,000	10,700	17,100
Work to proportional limit.....in.-lb. per cu. in.	7.5	6.9	4.2	7.5
Drop causing complete failure.....in.	43	49	42	37
Compression parallel to grain				
Crushing strength at proportional limit.....P.s.i.	6,440	7,050	3,090	4,760
Maximum crushing strength.....P.s.i.	8,020	11,100	3,560	7,440
Compression perpendicular to grain				
Crushing strength at proportional limit.....P.s.i.	1,700	2,160	850	1,320
Hardness -- ball test				
End.....lb.	1,820	2,060	1,120	1,520
Side.....lb.	1,920	2,230	1,060	1,360
Shearing strength				
Average radial and tangential.....P.s.i.	1,740	2,180	1,250	2,000
Tension perpendicular to grain				
Average radial and tangential.....P.s.i.	1,020	710	770	800

<sup>1</sup>Data obtained from Indian Forest Records (1953) Vol. 18, Part 10, "The Physical and Mechanical Properties of Woods Grown in India," Five trees represented (11).

<sup>2</sup>Data from U.S. Dept. Agr. Tech. Bull. 479, "Strength and Related Properties of Woods Grown in the United States." 20 trees represented.

<sup>3</sup>Data for dry tests were adjusted from values given in the reference (footnote 1) for 10.5 percent moisture content by application of the usual exponential relationship, assuming an "intersection point" of 25 percent.

Rept. No. 1938

Z M 95239 F