Technology Transfer Fact Sheet

Center for Wood Anatomy Research

USDA Forest Service • Forest Products Laboratory • One Gifford Pinchot Drive • Madison, Wisconsin 53726–2398

Manilkara bidentata

Family: Sapotaceae

Bulletwood

Balata

Other Common Names: Chicozapote (Mexico), Ausubo (Puerto Rico, Dominican Republic), Nispero (Panama), Beefwood (Guyana), Bolletri (Surinam), Balata rouge (French Guiana), Macaranduba (Brazil).

Distribution: Widely distributed throughout the West Indies, Central America, and northern South America; occurs in many forest types and not exacting as to soil or topography. Locally frequent.

The Tree: Well-formed tree reaching heights of 100 to 150 ft and diameters of 2 to 4 ft, occasionally up to 6 ft or more. Boles straight and clear to 60 ft, often basally swollen.

The Wood:
General Characteristics: Heartwood light to dark reddish brown, distinct but not sharply demarcated from the whitish or pale brown sapwood. Texture fine and uniform luster low to medium; grain straight to occasionally slightly wavy or interlocked; without distinctive odor or taste.

Weight: Basic specific gravity (ovendry weight/green volume) 0.85; air-dry density 66 pcf.

Mechanical Properties: (First and third sets of data based on the 2-in. standard; second on the 1-in. standard.)

Moisture content (%)	Bending strength (Psi)	Modulus of elasticity (1,000 psi)	Maximum crushing strength (Psi)
Green (74)	17,310	2,700	8,690
12%	27,280	3,450	11,640
12% (24)	29,200	3,520	13,300
12% (20)	32,600	NA	15,200

Janka side hardness 2,230 lb for green material and 3,190 lb at 12% moisture content. Forest Products Laboratory toughness average for green and dry material is 265 in.-lb. (5/8-in. specimen).

Drying and Shrinkage: Balata or bulletwood is generally reported to be a difficult wood to air-season, tending to develop severe checking and warp. However, if piled to assure a slow rate of drying, degrade can be kept to a minimum. A kiln schedule similar to T1-B1 has been suggested. Shrinkage green to ovendry: radial 6.3%; tangential 9.4%; volumetric 16.9%.

Working Properties: The wood is moderately easy to work despite its high density, rated good to excellent in all operations. Gluing requires special care to acquire good bond. Steam-bending properties are rated excellent.

Durability: Very resistant to attack by decay fungi; highly resistant to subterranean termites and moderately resistant to dry-wood termites. Not resistant to marine borer attack.

Preservation: Has high resistance to absorption of moisture and is also highly resistant to preservation treatments.

Uses: Heavy construction, textile and pulp mill equipment, furniture parts, turnery, tool handles, flooring, boat frames and other bent work, railway crossties, violin bows, billiard cues, and other specialty uses. Also well known for its yield of balata or gutta-percha collected from tapped trees.

Additional Reading:: (20), (24), (46), (74)

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46. Longwood, F. R. 1962. Present and potential commercial timbers of the Caribbean. Agriculture Handbook No. 207. U.S. Department of Agriculture.

74. Wangaard, F. F., and A. F. Muschler. 1952. Properties and uses of tropical woods, III. Tropical Woods 98:1-190.

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