Centre Technique Forestier Tropical

DIAGRAMS OF TECHNOLOGICAL CHARACTERISTICS OF MAIN TROPICAL TIMBERS

TOME IX
NORTH AUSTRALIAN TIMBERS

WITHIN THE SAME COLLECTION

TOME I - BOIS D'AFRIQUE
TOME II - BOIS DE GUYANE
TOME III - BOIS DE GUADELOUPE
TOME III - TIMBERS OF GUADELOUPE
TOME IV - BOIS DE NOUVELLE CALEDONIE
TOME V - BOIS DE MADAGASCAR
TOME VI - BOIS DU BRESIL
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TOME IX - BOIS NORD AUSTRALIENS
TOME IX - NORTH-AUSTRALIAN TIMBERS

HOW TO READ THE COMPARATIVE TABLES

To offer specialists and users of tropical timbers a better understanding of the properties and the possible utilizations of one type of timber, this brochure shows the physical and mechanical properties for each species on a synoptic table where the properties of three tropical species, which are well-known commercially, appear on the background ; the latter are :

- AYOUS, with rather poor mechanical properties,
- SIPO, which might be considered average in comparison to all tropical timbers,
- and last, AZOBE with high mechanical properties.

This lay-out thus allows to compare one species with the reference species and to infer its possible uses.

As for the properties of the reference species, the curve shows the mean values of the trial results only. Whereas for the species listed in this brochure, the following are given :

1) The values of the results of trials carried out at the Centre Technique Forestier Tropical (each point corresponds to the mean value of a trial ; the latter is obtained from 10 test samples from the same tree),

2) The curve following the mean value of the trial results.

The distribution of the points around the mean value thus describes the variability of the property.

Among the main physical and mechanical properties that allow a comparison of species with one another, the following were chosen :

- **DENSITY** : its value corresponds to a 12 % moisture content of wood.
- **HARDNESS** : it is drawn up according to the French standard (Chalais - Meudon scale), and is also given for a 12 % moisture content of wood.

– **VOLUMIC SHRINKAGE** : it corresponds to the volumic shrinkage of a piece of wood with a 1 % variation in moisture content. It should be stressed that this shrinkage appears below its saturation point. This value gives indications essentially on « the movement of wood ».

– **TOTAL TANGENTIAL SHRINKAGE** : it corresponds to the change in the size of a piece of wood from green to oven-dry state and is measured perpendicularly to the rays of wood.

– **TOTAL LINEAR RADIAL SHRINKAGE** : it corresponds to the change in the size of a piece of wood from green to oven-dry state and is measured parallel to the rays of wood.

NOTA BENE : Radial, as well as tangential shrinkage allow to determine the dimensions (with leeway) for sawing, and also provide indications on risks of distortion at drying stage.

– **COMPRESSION STRENGTH** : it is determined for a 12 % moisture content of wood, and corresponds to the strength (in kg/cm^2) which has to be applied in a parallel direction to the grain, so as to break the test sample (section : 4 cm^2 - Length : 6 cm).

– **BENDING STRENGTH** : it is determined for a 12 % moisture content of wood, and it corresponds to the strength (in kg/cm^2) which has to be applied to a 34 x 2 x 2 cm test sample lying on its side on a 28 cm span, in order to break it.

– **MODULUS OF ELASTICITY** : it is calculated from bending strength trials, and it corresponds to the strength/distortion ratio index.

Although the above mentioned properties allow to assess the possible uses of a timber with accuracy, other elements remain nonetheless of high importance for the utilization of these timbers, i.e. :

– durability and impregnation.
– silica content.
– and speed of drying.

In an appendix, the main properties and the possible uses of the timbers listed in this collection are given.

LIST OF NORTH AUSTRALIAN SPECIES STUDIED FOR THIS DOCUMENT

Local name	Scientific name
CYPRESS PINE	*Callitris spp.*
GUTTA PERCHA	*Excoecaria parvifolia*
IRONWOOD	*Erythrophleum chlorostachys*
LANCEWOOD	*Acacia shirleyii*
PAPERBARK	*Melaleuca dealbata*
STRINGYBARK	*Eucalyptus tetrodonta*

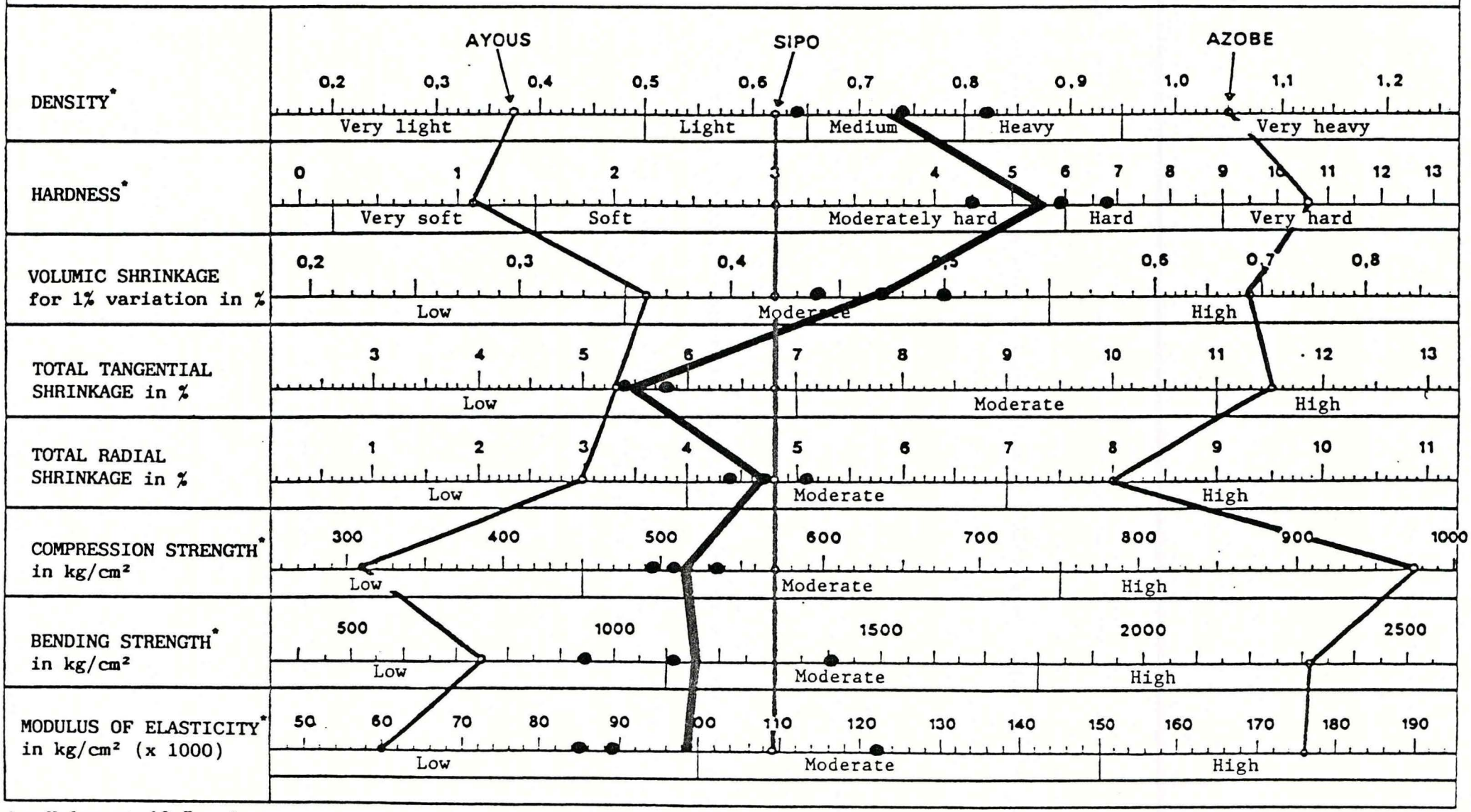
COMPARATIVE TABLES

CYPRESS PINE (CALLITRIS SPP.)

MAIN PHYSICAL AND MECHANICAL PROPERTIES

COMPARISON WITH THREE REFERENCE SPECIES

N of trials carried out : 3 — 1 point = 1 trial



* = Value at 12 % moisture content

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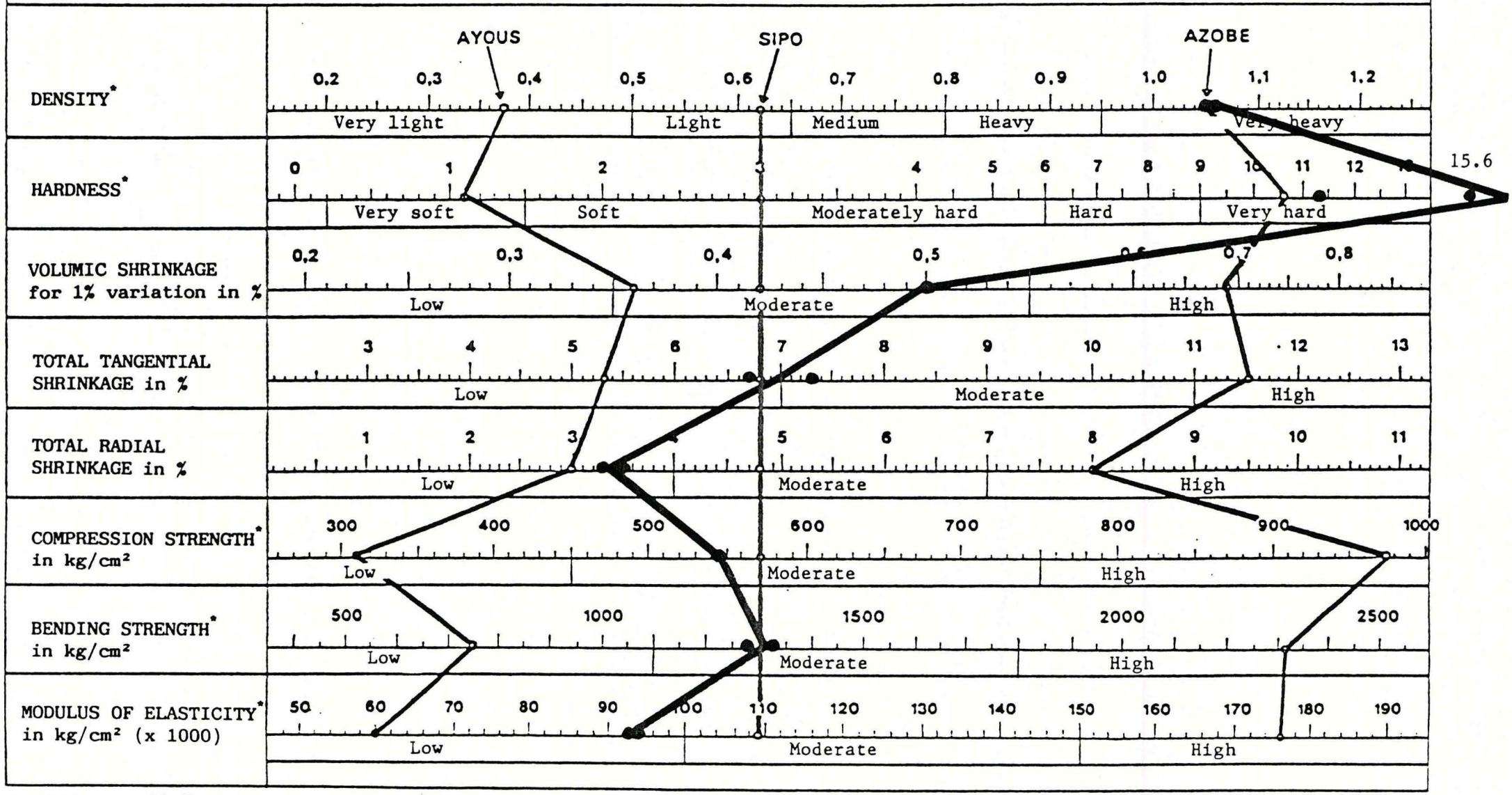
GUTTA PERCHA (EXCOECARIA PARVIFOLIA)
MAIN PHYSICAL AND MECHANICAL PROPERTIES

COMPARISON WITH THREE REFERENCE SPECIES

N of trials carried out : 2 1 point = 1 trial



* = Value at 12 % moisture content

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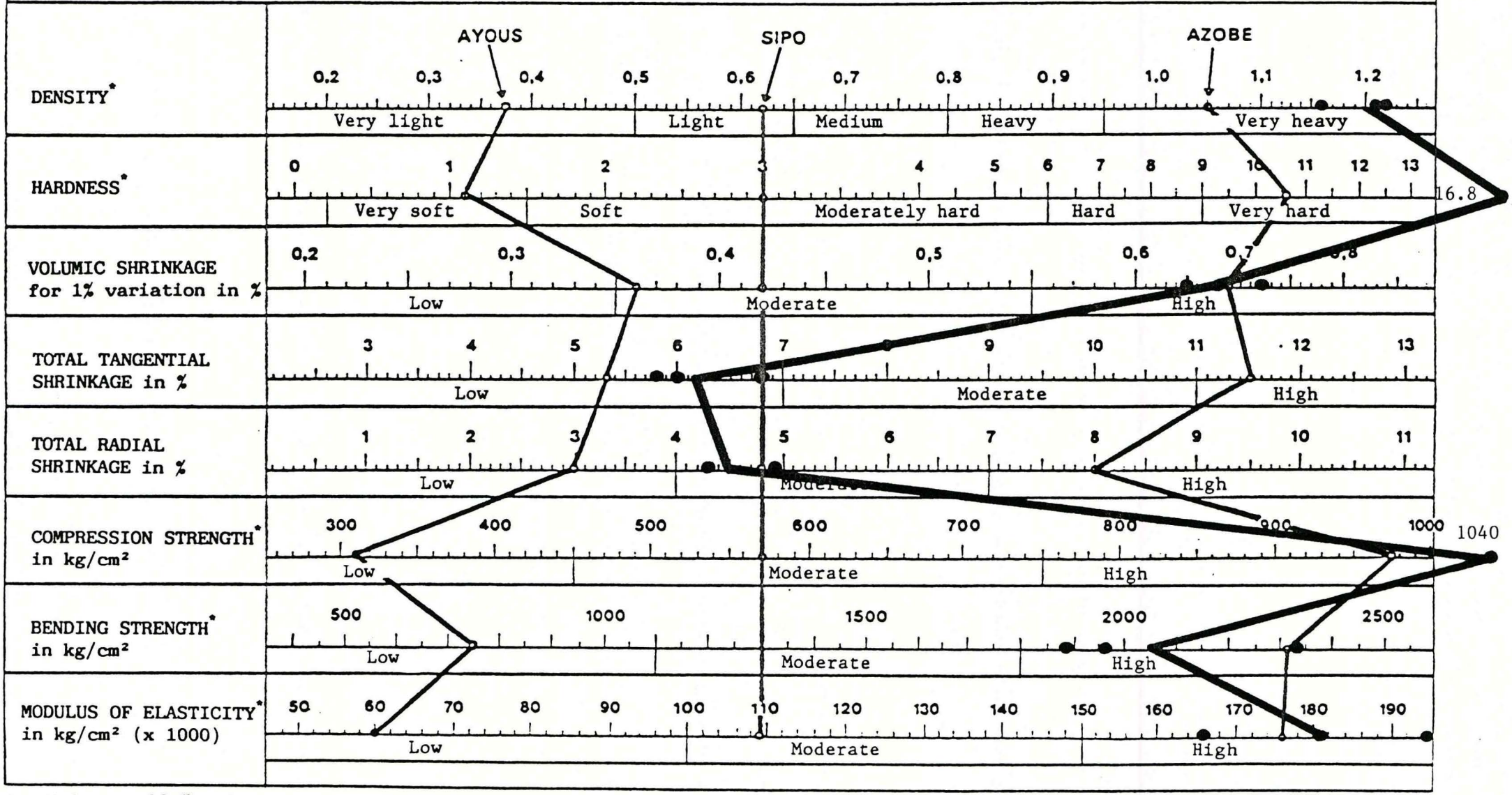
IRONWOOD (ERYTHROPHLEUM CHLOROSTACHYS)

MAIN PHYSICAL AND MECHANICAL PROPERTIES

COMPARISON WITH THREE REFERENCE SPECIES

N of trials carried out : 3 — 1 point = 1 trial



* = Value at 12 % moisture content

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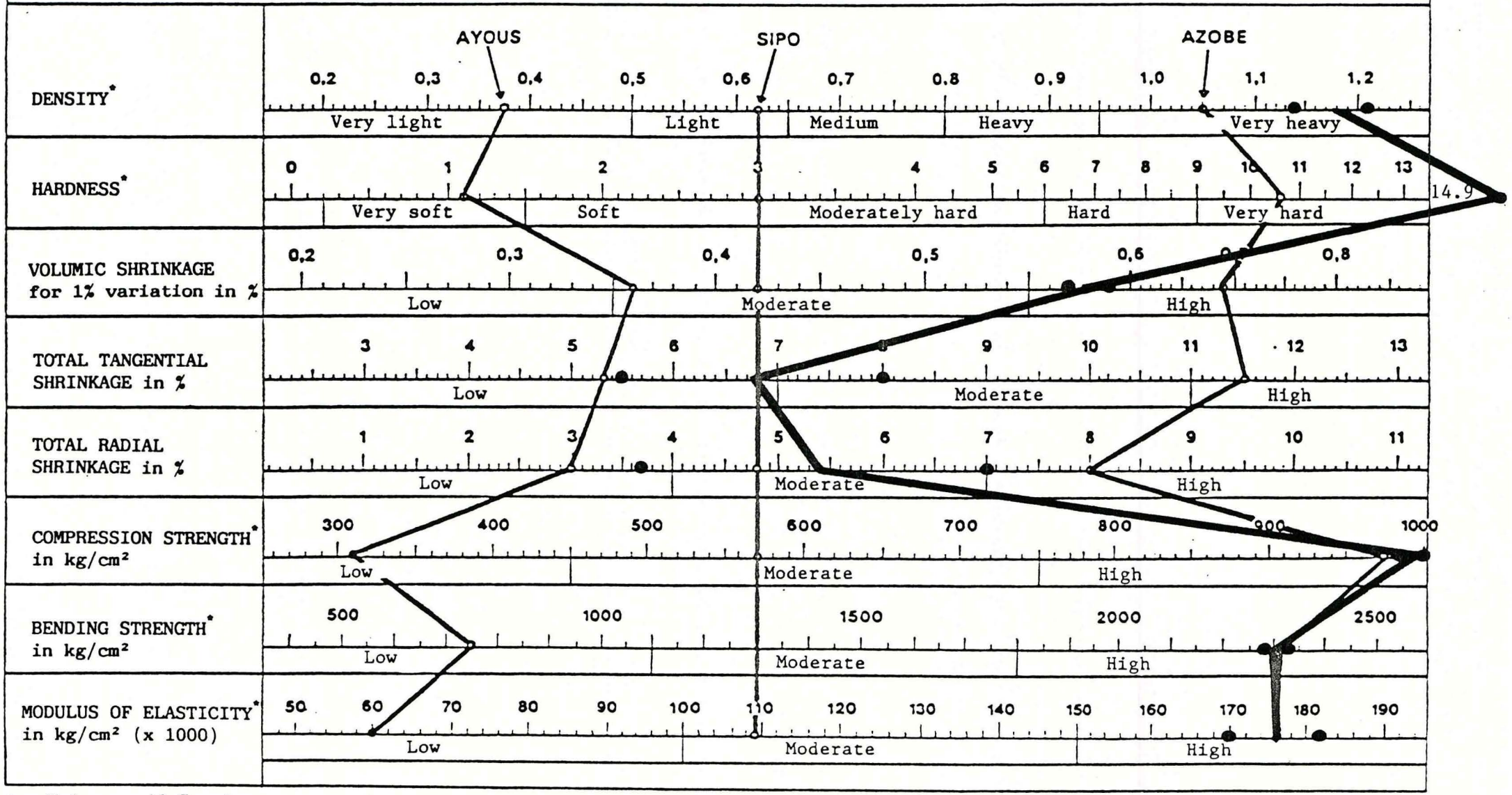
LANCEWOOD (ACACIA SHIRLEYII)
MAIN PHYSICAL AND MECHANICAL PROPERTIES

COMPARISON WITH THREE REFERENCE SPECIES

N of trials carried out : 2 — 1 point = 1 trial



* = Value at 12 % moisture content

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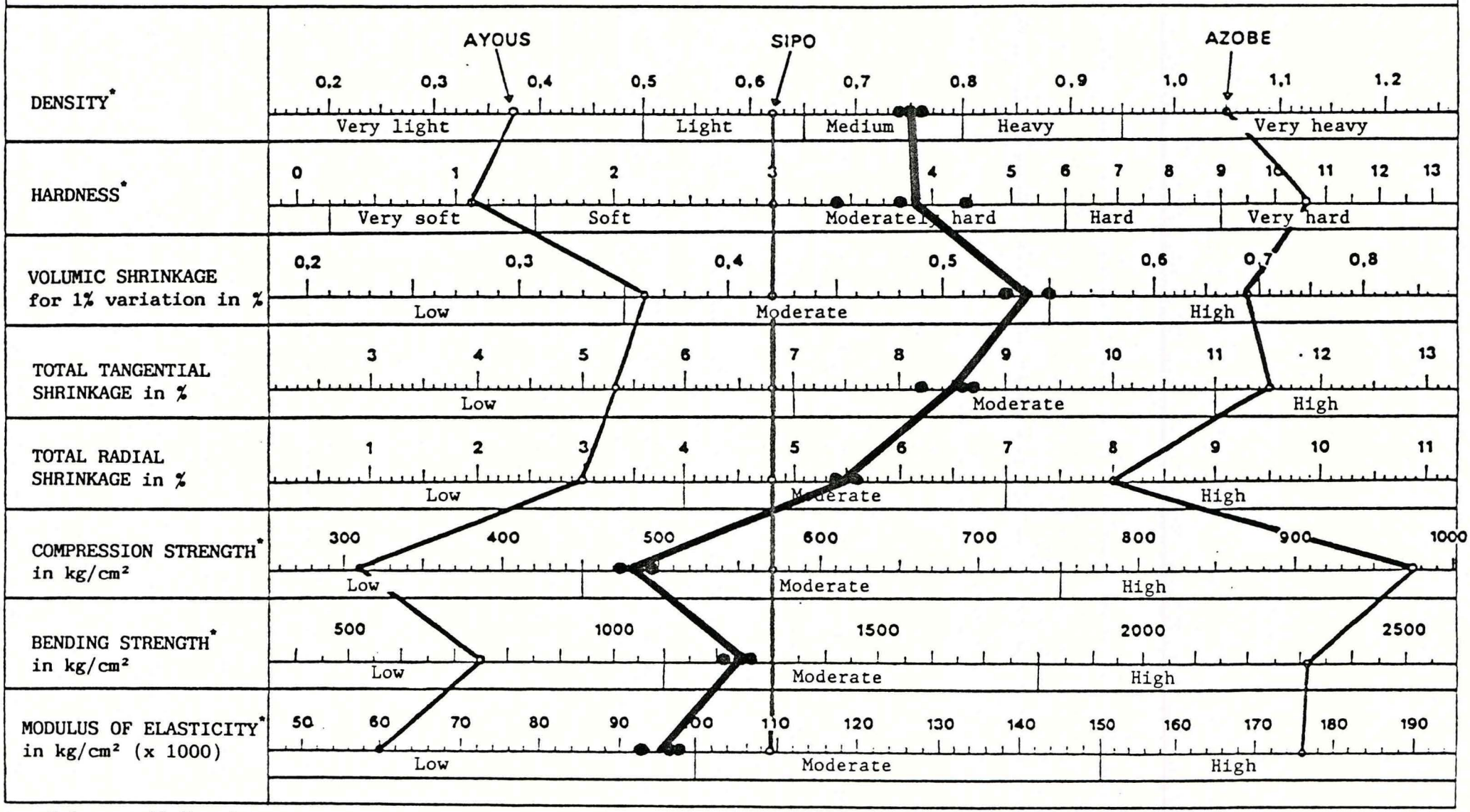
PAPERBARK (MELALEUCA DEALBATA)

MAIN PHYSICAL AND MECHANICAL PROPERTIES

COMPARISON WITH THREE REFERENCE SPECIES

N of trials carried out : 3 — 1 point = 1 trial



* = Value at 12 % moisture content

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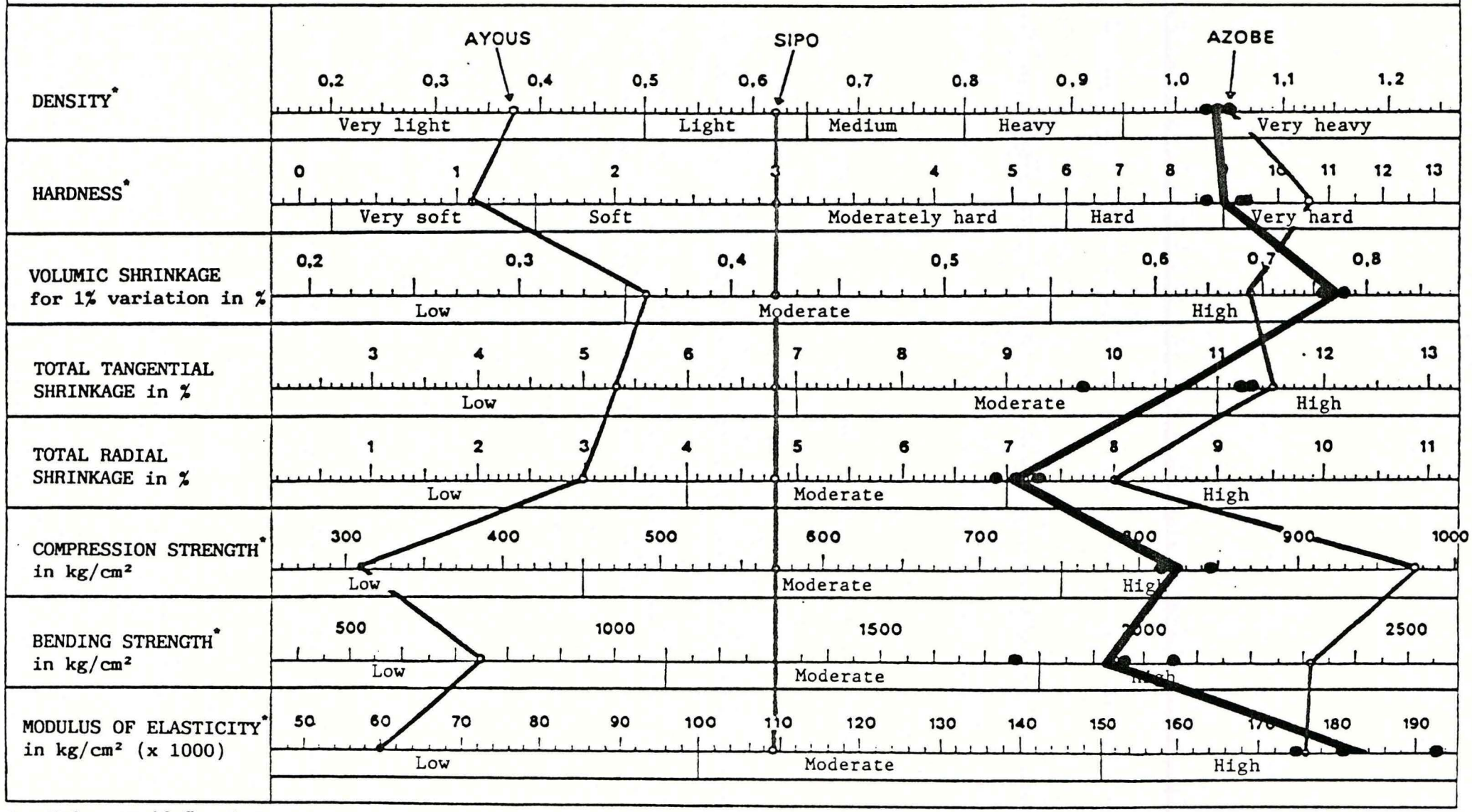
STRINGYBARK (EUCALYPTUS TETRODONTA)
MAIN PHYSICAL AND MECHANICAL PROPERTIES

COMPARISON WITH THREE REFERENCE SPECIES

N of trials carried out : 3 1 point = 1 trial



* = Value at 12 % moisture content

CENTRE TECHNIQUE FORESTIER TROPICAL, 45 bis, avenue de la Belle-Gabrielle, 94130 NOGENT-SUR-MARNE (VAL-DE-MARNE) - FRANCE

MAIN CHARACTERISTICS OF USES

Names	Conformation of the logs	Description of the wood	Characteristics	Processing	Possible uses
CYPRESS PINE (Callitris spp)	Straight and cylindrical Diameter 0.30 to 0.70 m.	Heartwood : light brown Sapwood : distinct Grain : very slightly wavy Texture : fine	Density : medium Hardness : moderately hard to hard Shrinkage : low to moderate Compression strength : moderate Bending strength : low to moderate	Sawing : Easy Drying : Easy Machining : Easy	Construction - Interior joinery - Ordinary furniture - Packaging purposes
GUTTA PERCHA (Excoecaria parvifolia)	Straight and generally cylindrical Diameter 0.30 to 0.60 m.	Heartwood : dark brown, finely striped Sapwood : clearly distinct Grain : generally straight sometimes wavy Texture : fine Presence of fluid resin	Density : very heavy Hardness : very hard Shrinkage : low to moderate Compression strength : moderate Bending strength : moderate	Sawing : requires power Drying : easy, but slow Machining : no difficulty, special tools recommended Resin may clog the tools	Sliced veneers - Cabinetwork - - Turnery - High-class furniture Interior fittings - Flooring - Interior decoration - Brush backs - Moulding
IRONWOOD (Erythrophleum chlorostachys)	Straight and cylindrical Diameter averaging 0.50 m.	Heartwood : red brown with fine pale yellow streaks Sapwood : distinct Grain : wavy Texture : medium	Density : very heavy Hardness : very hard Shrinkage : low to high Compression strength : high Bending strength : high	Sawing : requires power Drying : requires care (risks of checking) Machining : no difficulty, special tools recommended	Heavy joinery - Turnery - Sawn veneers - Flooring - Interior fittings - Stairs

Names	Conformation of the logs	Description of the wood	Characteristics	Processing	Possible uses
LANCEWOOD (Acacia shirleyii)	Straight sometimes slightly fluted Diameter averaging 0.40 m.	Heartwood : dark brown,sometimes ribbon figure (interlocked grain) Sapwood : distinct Grain : straight or interlocked Texture : medium	Density : very heavy Hardness : very hard Shrinkage : low to high Compression strength : high Bending strength : high	Sawing : requires power Drying : slow, sometimes risks of superficial checking Machining : easy, but sometimes irregular surface	Turnery – Flooring – Furniture components – Heavy joinery – Interior fittings – Brush backs – Interior decoration –
PAPERBARK (Melaleuca dealbata)	Straight and cylindrical Diameter 0.50 to 1.00 m. and more	Heartwood : greyish pink Sapwood : not clearly distinct Grain : slightly wavy and irregular Texture : medium	Density : medium Dureté : moderately hard Shrinkage : moderate Compression strength : moderate Bending strength : moderate	Sawing : easy, but slight blunting effect (stellited saw teeth recommended) Drying : slow, requires care (risks of checking) Machining : easy, special tools	Sliced veneers– Construction – – Furniture – Flooring
STRINGYBARK (Eucalyptus tetrodonta)	Straight and cylindrical Diameter 0.40 to 0.70 m. and more	Heartwood : salmon brown Sapwood : distinct Grain : straight or very slightly interlocked Texture : medium	Density : very heavy Hardness : hard to very hard Shrinkage : moderate to high Compression strength : high Bending strength : high	Sawing : presence of growing stresses, sawing in the round or symmetrical sawing is recommended Drying : requires care (risks of splitting on core stock) Machining : no difficulty, special tools recommended	Construction - Flooring – Furniture components

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