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WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE. II. *MASTICHODENDRO--ETC(U)
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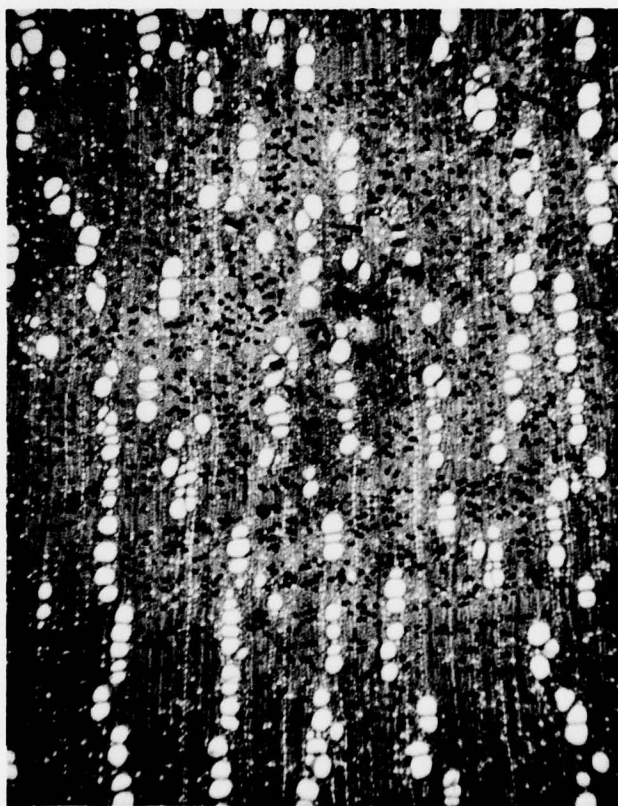
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**WOOD ANATOMY
OF THE
NEOTROPICAL SAPOTACEAE
II. MASTICHODENDRON**

RESEARCH PAPER FPL 326

FOREST PRODUCTS LABORATORY
FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE
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Preface

The Sapotaceae form an important part of the ecosystem in the neotropics; for example, limited inventories made in the Amazon Basin indicate that this family makes up about 25% of the standing timber volume there. This would represent an astronomical volume of timber but at present only a very small fraction is being utilized. Obviously, better information would help utilization--especially if that information can result in clear identification of species.

The Sapotaceae represent a well-marked and natural family but the homogeneous nature of their floral characters makes generic identification extremely difficult. This in turn is responsible for the extensive synonymy.

Baehni and Bernardi (3) state the situation with respect to Peru but this would hold equally well for all of the neotropics: "For instance, of the 39 species and one variety described hereunder, 13 are known only from the Peruvian type; and 23 taxa here presented have no fruit or seed. It is universally admitted that the taxonomy of this family is almost impossible without--for the same species--leaves, flowers, fruits, and seeds."

Unfortunately, species continue to be named on the basis of flowering or fruiting material alone and this continues to add to the already confused state of affairs.

This paper on Mastichodendron is the second in a series describing the anatomy of the secondary xylem. The first was on Bumelia and is listed in the literature cited at the end of this paper. Others will follow in the same pattern.

Publication in this manner will afford interested anatomists and taxonomists the time to make known their opinions and all such information is hereby solicited. At the termination of this series the data will be assembled into a single comprehensive unit.

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WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE

II. MASTICHODENDRON

By

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B. F. Kukachka, Botanist^{1/}

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Forest Products Laboratory, Forest Service
U.S. Department of Agriculture

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Abstract

The genus Mastichodendron as established by Cronquist consists of a small group of closely related species native to southern Florida, the West Indies, and Central America. The hard, heavy, fine-textured woods typically have a yellowish cast. Anatomically they are characterized by reticulate-diffuse parenchyma and an abundance of two-sized crystals in the parenchyma and wood rays. Silica is lacking.

Introduction

For many years a number of American Sapotaceae were referred to the genus Sideroxylon. In 1946 Cronquist (4) described Mastichodendron as a new genus segregated from Sideroxylon and established five species and varieties native to southern Florida, the West Indies, and Central America.

What would appear to be the sixth species, Mastichodendron williamsii (Baehni) Baehni ex Bernardi (3) based on Williams 3198 from Peru, is actually a species of Micropholis. This species is known only from the type locality and the description is based on leaves and young flowers; the fruit and seed is unknown. The description in "Flora of Peru" (3) suggests Micropholis to this author and this opinion is verified by the wood anatomy of the available wood specimen (Williams 3198).

Baehni (2) adopted Mastichodendron as a segregate from Sideroxylon but included species from Africa and southeast Asia. He also placed

1/ Pioneering Research Unit, FPL. The Laboratory is maintained at Madison, Wis. in cooperation with the University of Wisconsin, Madison.

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Mastichodendron capiri (A.DC.) Cronquist in synonymy under Paralabatia capiri (A.DC.) Baehni. Anatomically these two genera are very different and, in this author's opinion, the transfer is not justified.

Aubréville (1) also adopted Mastichodendron but included only the American species, which is in accord with the treatment by Cronquist. In Aubréville's treatments, the genus Sideroxylon is limited to Africa.

Record (6) provided a brief anatomical description of three American species under the genus Sideroxylon which are now considered as belonging to Mastichodendron. He mentioned three additional species of Sideroxylon which differed significantly from those he had described, and referred to these as an "unnamed group." It is now known that the three species of this "unnamed group" belong to three different genera.

The genus Mastichodendron as treated by Cronquist is in complete accord with the wood anatomy as developed in this study.

Materials and Methods

Four of the five species described by Cronquist (4) were available for this study. Wood of Mastichodendron floribundum (Griseb.) Cronquist of Jamaica was not investigated. Apparently this is a rare species since Cronquist cited only the type and two additional collections in his monograph. In all, 55 wood specimens were studied with the greatest representation being in M. foetidissimum typicum, which is the type of the genus (table 1).

The methodology employed was described in the first publication of this series (5).

Description of the Wood

General: Wood lustreless with a yellowish cast, passing with age to a pale yellowish-brown. Growth rings demarcated by zones of fibrous tissue which are quite free of parenchyma. Wood hard, heavy, fine-textured. Specific gravity (range of individual specimens) from 0.68 in juvenile wood of foetidissimum typicum to 1.10 in mature wood of this species from Cuba; generic average 0.93 for 55 specimens.

Anatomical:

Typically diffuse-porous or approaching a radial alinement of the pore multiples, which is most evident in the Central American material (figs. 1-2). Pores most commonly in radial multiples

of 2-3 (4); solitary pores present but comprise only a small percentage of the total. Maximum pore diameters observed in individual specimens range from 87 μm to 102 μm in juvenile wood to 205 μm in the mature wood of Belizense. The most common maximum observed in mature wood was 158 μm .

Vessel member length averages range from 450 μm in juvenile wood of foetidissimum typicum to a maximum of 970 in one specimen of capiri tempisque. The generic average for 55 specimens was 670 μm . The longest elements occur in capiri tempisque in which the average was 780 μm .

Inter-vessel pit-pairs 4-6 μm in diameter. Perforations simple. Tyloses common in the heartwood; thin-walled. Very large two-sized crystals are found rather frequently in the tyloses of foetidissimum typicum.

Axial parenchyma diffuse and reticulate or with a hand lens showing a more or less definite uniseriate banding which is closely spaced (figs. 3-4). The latter condition is most common in the Central American specimens. Short crystalliferous strands common, consisting of the usual rhombic crystals and frequently with rhombic and very small crystals in the same cell (2-sized). Microcrystals (crystal sand) were observed in many specimens of foetidissimum typicum but were not seen in the other species examined.

Wood rays (1)2-3(4) seriate; heterocellular. Vertical fusions common. Maximum height of the 2-3 seriate portions of the rays range from 200 μm to 630 μm with an overall average of 345 μm . Vessel-ray pitting various but commonly round or ovate and larger than the inter-vessel. Rhombic and two-sized crystals frequent in all specimens and generally confined to the square or erect marginal cells. Microcrystals were observed in a few specimens of foetidissimum typicum. Organic contents sparse and generally occur in isolated cells as yellow-brown globules.

Wood fibers thick-walled; specimen averages for fiber length range from 1.09 mm in juvenile material to 2.22 in mature wood of capiri tempisque from Costa Rica. Average fiber length for all specimens was 1.59 mm. The fiber length of the Central American specimens is generally above the generic average. Vascular tracheids common in all specimens.

Diagnostic features: Wood yellowish; parenchyma reticulate-diffuse; rhombic and two-sized crystals abundant in parenchyma and wood rays; silica lacking.

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U.S. Forest Products Laboratory.

Wood anatomy of neotropical Sapotaceae:
II. Mastichodendron, by B. F. Kukachka.
Res. Pap. FPL 326, For. Serv., U.S. Dep. Agr.,
Madison, Wis. 9 p.

Consists of a small group of closely related species native to southern Florida, West Indies, and Central America. The hard, heavy, fine-textured woods typically have a yellowish cast. Characterized by reticulate-diffuse parenchyma and an abundance of two-sized crystals in parenchyma and wood rays. Silica is lacking.

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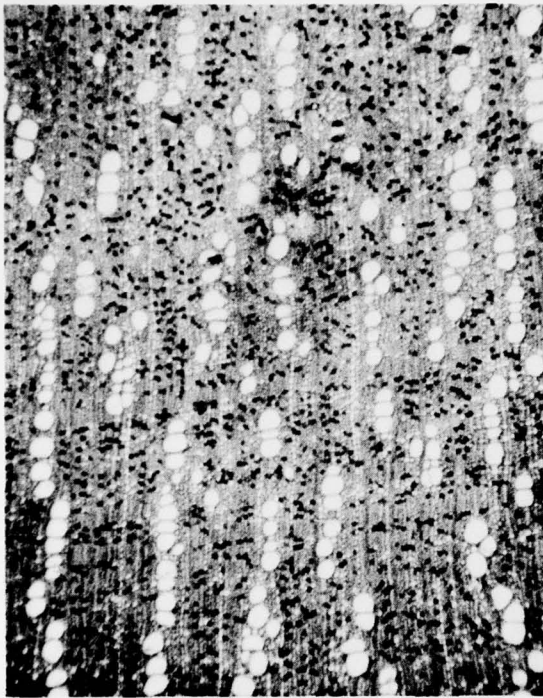


Figure 1.--M. foetidissimum typicum
(Stern-Brizicky 467) Arrangement
of pores and parenchyma X 30.

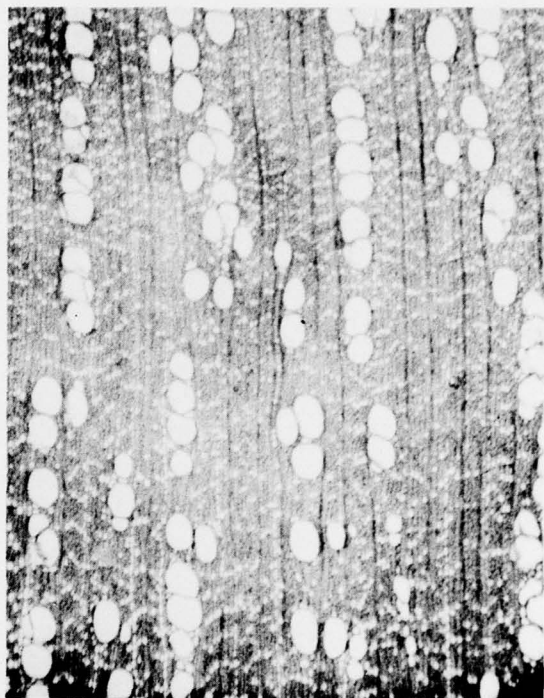


Figure 2.--M. capiri tempisque
(Kress 31) Arrangement of pores
and parenchyma X 30.

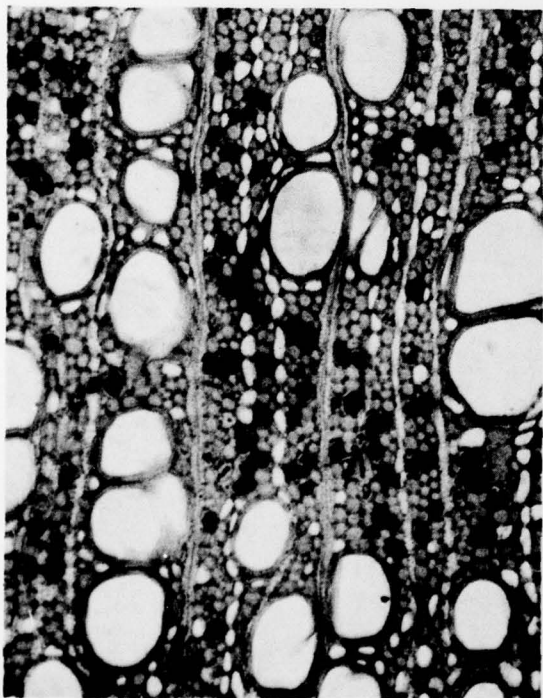


Figure 3.--M. foetidissimum typicum
(Stern-Brizicky 467) illustrating
parenchyma detail. The dark-colored
cells are crystalliferous. X 110.

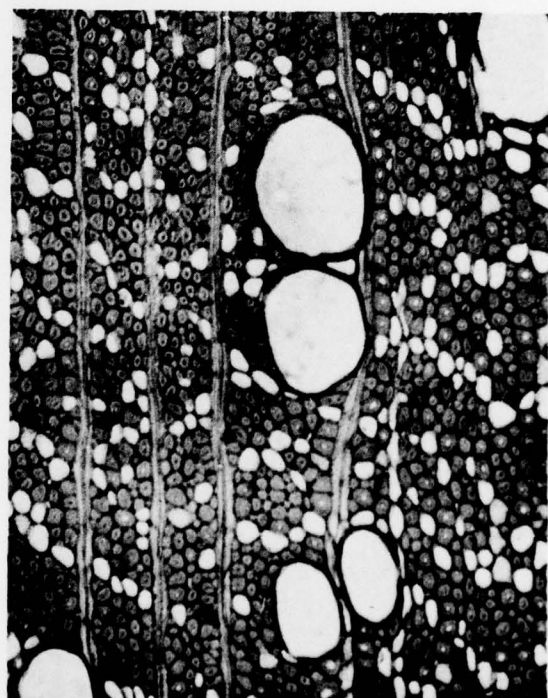


Figure 4.--M. capiri tempisque
(Kress 31) Showing parenchyma
detail. X 110.

Table 1.--Wood specimens of *Mastichodendron* examined

Species	Collector and Number	Origin	Numbers in wood collection	
			MADw	SJRw*
<i>angustifolium</i> (Standl.) Cronquist	Commercial	179	Salvador	3623
	Ortega	sn	Mexico	10427
<i>belizense</i> (Lundell) Cronquist	Finding	10	Belize	41070
<i>capiri tempisque</i> (Pittier) Cronquist	Broadway	sn	Trinidad	20867(H)
	Calderon	sn	Salvador	7509
	Edwards	371	Honduras	20865(H)
	Hamilton	sn	Costa Rica	3579
	Hottle	27	Honduras	15605
	Kress	5	Costa Rica	11212
	Kress	31	Costa Rica	12175
	Moncado	sn	Honduras	16175
	Purdy	6	Costa Rica	6091**
	Forest Service	305	Trinidad	37960
	Whitford-Stadtmitter	71	Guatemala	10844 3730
<i>foetidissimum gaumeri</i> (Pittier) Cronquist	Maderas Trop.	25	Mexico	11260 48091
	Stevenson, D.	24	Belize	12004
	Stevenson, N. S.	117	Belize	35039
<i>foetidissimum typicum</i> Cronquist	Commercial		Bahamas	2000
	Commercial		Puerto Rico	3600
	Commercial	56	Puerto Rico	4573
	Commercial		Dom. Rep.	7012
	Abbot	919	Dom. Rep.	7066
	Anderson	91	Florida	45882
	Cons. For.	123	Jamaica	48005**
	Curran-Haman	308	Curacao	2152
	Cowles	319	Puerto Rico	47822
	Curtiss	461	Florida	20442
	Durland	sn	Puerto Rico	8046
	Durland	22	Dom. Rep.	5041
	Forest Service	80	Haiti	19561
	Fors	24	Cuba	14410 15859
	Gill	9	Cuba	9523
	Graves	sn	Cuba	5006
	Hodge	sn	Dominica	53170
	Hutchinson	sn	Cuba	38294
	Jack	5530	Cuba	16616
	MacDonald	22	Florida	32534
	Matthews-Crosby	7	Cuba	9164
	Matthews-Crosby	17	Cuba	9174
	Mell	sn	Florida	2980
	Mell	sn	Florida	2982
	Miller	1629	Puerto Rico	20856
	Miller	1697	Florida	20979
	Pittier	268	Venezuela	8254
	Rhoads	8313	Florida	9339 49052
	Scarff	5	Dom. Rep.	35295
	Schiffino	8	Dom. Rep.	35157
	Schiffino	37	Dom. Rep.	35176
	St. Louis Expo.		Cuba	744
	St. Louis Expo.		Cuba	821
Stern-Brizicky	467	Florida	18269 51250	
Stern-Brizicky	483	Florida	18271 51266	
Wilson	35	Florida	15978	
10th Census	136	Florida	5180	
10th Census	182	Florida	5182	

* Specimen numbers in the right column, followed by letter (H), are from the Harvard Wood Collection.

** From cultivated specimens.