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WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE. XIV. ELAEOLUMA. (U)
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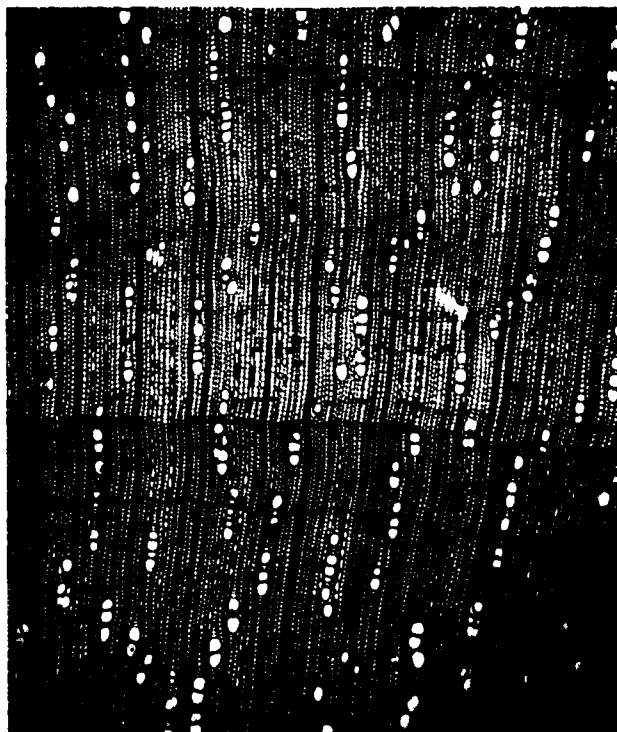
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**WOOD ANATOMY
OF THE
NEOTROPICAL SAPOTACEAE
XIV. ELAEOLUMA**

RESEARCH PAPER FPL 358

*FOREST PRODUCTS LABORATORY
FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE
MADISON, WIS.*

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Abstract

The genus Elaeoluma consists of three species distributed in the Amazon Basin, Surinam, Guyana, and Venezuela. The description presented here is based on E. glabrescens of the Amazon Basin. The wood is easily differentiated from all other neotropical Sapotaceae by its pale brown color, reticulate parenchyma, which is hardly discernable with a hand lens, and a low specific gravity averaging 0.50. Whether the correct nomenclature is Elaeoluma or Gymnoluma is problematical and remains to be resolved by a monographer.

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 percent 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. 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 Elaeoluma is the fourteenth in a series describing the anatomy of the secondary xylem of the neotropical Sapotaceae. The earlier papers, all by the same author and under the same general heading, include:

- I. Bumelia--Research Paper FPL 325
- II. Mastichodendron--Research Paper FPL 326
- III. Dipholis--Research Paper FPL 327
- IV. Achrouteria--Research Paper FPL 328
- V. Calocarpum--Research Paper FPL 329
- VI. Chloroluma--Research Paper FPL 330
- VII. Chysophyllum--Research Paper FPL 331
- VIII. Diploon--Research Paper FPL 349
- IX. Pseudoxythece--Research Paper FPL 350
- X. Micropholis--Research Paper FPL 351
- XI. Priourella--Research Paper FPL 352
- XII. Neoxythece--Research Paper FPL 353
- XIII. Podoluma--Research Paper FPL 354

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.

WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE

XIV. ELAEOLUMA

FSRP-FPL-3281

By

B. F. Kukachka, Botanist^{1/}Forest Products Laboratory,^{2/} Forest Service
U.S. Department of Agriculture

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Introduction

According to Aubréville (1)^{3/} the genus Gymnoluma was established by Baillon in 1892 and was based on Lucuma glabrescens (Mart. and Eichl.) from the region of the Rio Negro in Brazil. At the same time he also established the genus Elaeoluma which was based on Chrysophyllum oleaefolium (Mart. and Eichl.) from the same region. Aubréville stated that it was not possible to maintain these genera as distinct and reduced Gymnoluma to synonymy under Elaeoluma. His reason for selecting Elaeoluma over Gymnoluma is not clear.

Aubréville (1) cites two species with their synonymy as follows:

Elaeoluma schomburgkiana (Miq.) Baill.
Myrsine schomburgkiana Miq. (1856)
Chrysophyllum oleaefolium Mart. and Eichl. (1863)
Oxythece schomburgkianum (Miq.) Cronquist (1946)

Elaeoluma glabrescens (Mart. and Eichl.) Aubr. Comb. nov.
Lucuma glabrescens Mart. and Eichl. (1863)
Vitellaria glabrescens (Mart. and Eichl.) Radlk. (1882)
Gymnoluma glabrescens (Mart. and Eichl.) Baill. (1892)

Later, Aubréville (2) added a third species, Elaeoluma nuda (Baehni) Aubr. based on Pouteria nuda Baehni.

Baehni (3) retained Gymnoluma glabrescens as the generic type and transferred two East African and one Amazonian species to Gymnoluma. At the

1/ Pioneer Research Unit, Forest Products Laboratory.

2/ Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

3/ Underlined numbers in parentheses refer to literature cited at the end of this report.

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same time schomburgkiana was transferred to the genus Amorphospermum. Baehni and Bernardi (4) in their flora of Peru, maintain Gymnoluma glabrescens (Mart. and Eichl.) Baill., and add to its synonymy the new species, Oxythece ferreirii of Cronquist (5). When Cronquist described Oxythece ferreirii he cited two specimens, Ferreira 516 from Brazil as the type and Williams 3669 from Peru. A wood specimen of Williams 3669 was available for this study and its anatomy is in agreement with other wood specimens received as Lucuma glabrescens and Elaeoluma glabrescens. Eyma (6) in a note under Pouteria (sect. Oxythece) robusta states, "Lucuma glabrescens appears related and will perhaps have to be reduced to a variety of Pouteria robusta." It would be difficult to conceive the placement of the low density wood of Glabrescens in synonymy under the very heavy wood of robusta. Compare anatomical descriptions and photomicrographs in Kukachka (7).

It is truly amazing that the monotypic genera of Baillon (Elaeoluma and Gymnoluma) could generate so much confusion. The author has ample material of Elaeoluma glabrescens but, unfortunately, no wood specimens of Elaeoluma schomburgkiana. Should any reader have a wood specimen(s) of schomburgkiana the author would appreciate having them for anatomical study and possible help in the clarification of a confused situation. One specimen of Elaeoluma nuda (Baehni) Aubr. was available for this study (Maguire 24596, Surinam) but is represented by a juvenile stem 3 cm in diameter. The juvenile nature of this specimen does not permit an accurate comparison with mature specimens of glabrescens.

For the sake of convenience and the necessity of assigning a name, the author has tentatively adopted the generic name Elaeoluma for this paper.

Description

Based on 10 specimens of Elaeoluma glabrescens (table 1).

General: Wood pale brown; light weight and fine-textured. Growth rings usually faint and consist of flattened wood fibers with occasional parenchyma cells. Specific gravity ranges from 0.38 to 0.61 with an overall average of 0.50. One of the lightest weight woods of the neotropical Sapotaceae.

Anatomical:

Pores essentially diffuse or with a definite tendency toward radial alignment (figs. 1 and 3). Pores mostly in radial multiples of 2 to 4 (6). Maximum tangential diameter of pores of the different specimens examined ranges from 79 μm to 110 μm .

Table 1.--Wood specimens of Elaeoluma examined

| Species | Collector and No. | Origin | Wood collection No. |
|---|-----------------------|---------|---------------------|
| <u>glabrescens</u> (Mart. and Eichl.) Aubr. | Bastos s.n. | Brazil | RB-413 |
| | Froes 202 | Brazil | A-27397 |
| | Froes 211 | Brazil | A-27403 |
| | Froes 257 | Brazil | A-27425 |
| | Froes 388 | Brazil | A-27492 |
| | Froes 491 d | Brazil | A-27512 |
| | Froes 509 | Brazil | A-27514 |
| | Froes 28227 | Brazil | RB-2808 |
| | Rodrigues-Coelho 2476 | Brazil | INPA-928 |
| <u>nuda</u> (Baehni) Aubr. | Williams 3669 | Peru | SJR-18268 |
| | Maguire 24596 | Surinam | SJR-44169 |

Vessel member length averages range from 610 μm to 1020 μm . This range within species seems rather excessive and possibly another species is included here under the name glabrescens. Three of the specimens, Froes 202, 257, and 28227 have a vessel member length average of 1,000 μm while in the other specimens the range is from 610 μm to 840 μm , with an average of 700 μm . Perforations simple. Inter-vessel pitting 6 to 8 μm in diameter. Tyloses, when present, thin-walled.

Axial parenchyma reticulate, barely discernable with a hand lens (figs. 2 and 4). Colored, organic deposits sparse to abundant. Silica infrequent.

Wood rays 1 to 2 (3) seriate; heterocellular. Vessel-ray pitting irregular in shape and size. Colored, organic deposits sparse to abundant. Maximum height of multiseriate portion of rays ranges from 197 μm to 394 μm . Silica common in the upright and tabular cells, spheroidal to irregular in shape and up to 20 μm in diameter (table 2).

Wood fibers relatively thin-walled, with an average length of 1.26 mm. Range of averages among specimens from 0.97 mm to 1.65 mm. Vascular tracheids sparse to lacking in a given maceration.

Diagnostic features: Wood pale brown; pores diffuse to radial arrangement, the individual pores not exceeding 110 μ m in tangential diameter; parenchyma reticulate but usually difficult to detect with a hand lens; silica present; vascular tracheids sparse or lacking (macerated material). Probably the lightest of the neotropical Sapotaceae with an average specific gravity of 0.50.

Table 2.--Silica and total ash content of Elaeoluma
wood specimens^{1/}

| Collector and No. | Source | Silica | Total ash |
|-----------------------|--------|--------|-----------|
| | | Pct | Pct |
| Williams 3669 | Peru | 0.99 | 2.17 |
| Rodrigues-Coelho 2476 | Brazil | .47 | 1.25 |
| Froes 211 | Brazil | .27 | 1.08 |
| Froes 491 d | Brazil | .23 | .63 |
| Froes 509 | Brazil | .22 | .81 |
| Froes 388 | Brazil | .19 | .92 |
| Froes 257 | Brazil | .14 | .78 |
| Froes 202 | Brazil | .12 | .90 |
| Froes 28227 | Brazil | .05 | .65 |
| Bastos s.n. | Brazil | 1.41 | 2.31 |

^{1/} The author is indebted to Martin F. Wesolowski for the chemical analysis.

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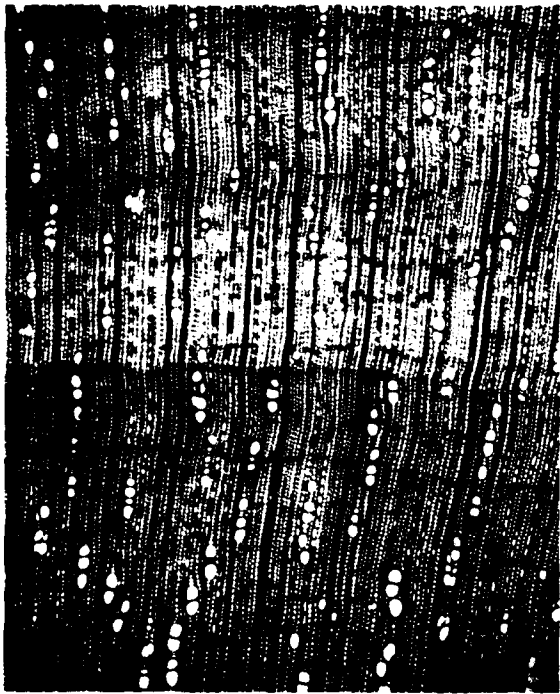


Figure 1.--*Elaeoluma glabrescens*, pore and parenchyma arrangement (Rodrigues-Coelho 2476) X 30.

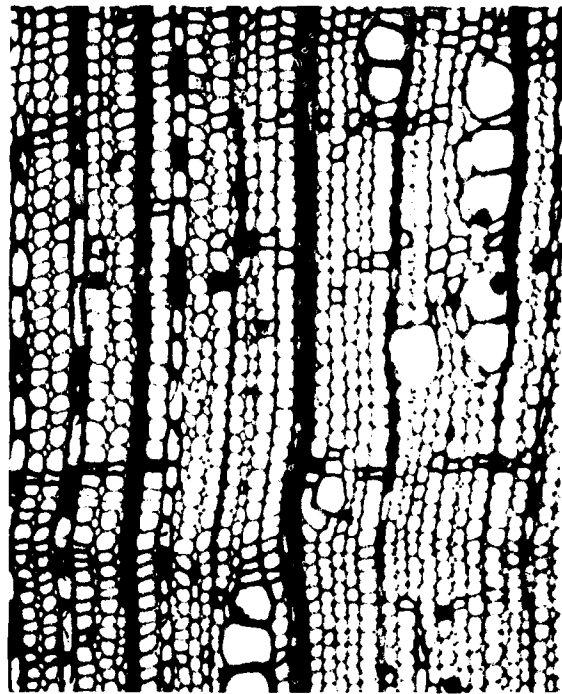


Figure 2.--Same as figure 1, parenchyma detail X 110.

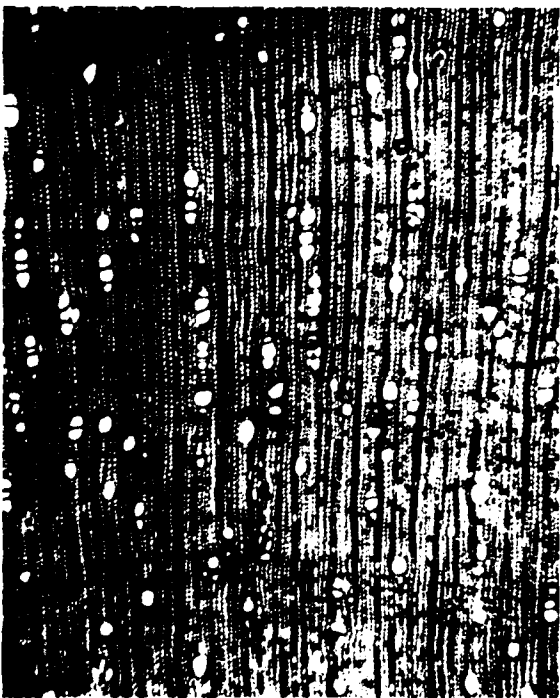


Figure 3.--*E. glabrescens*, pore and parenchyma arrangement (Williams 3669) X 30.

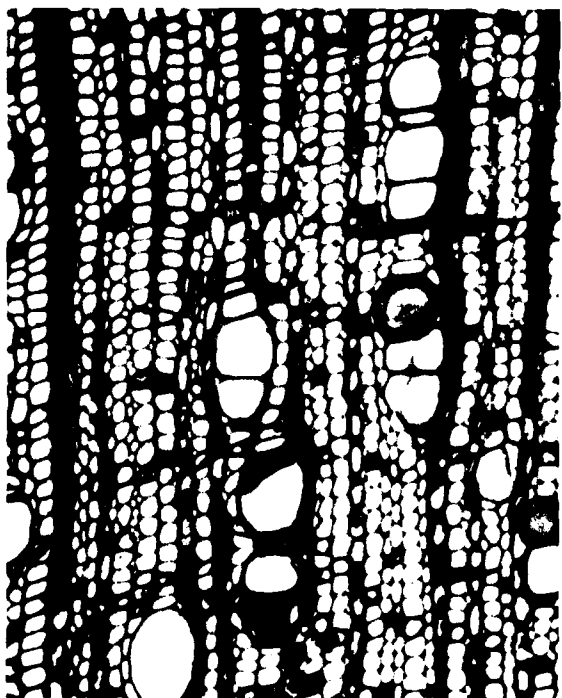


Figure 4.--Same as figure 3, parenchyma detail X 110.

Literature Cited

1. Aubréville, Andre.
1961. Notes sur les Sapotacées Africaines and Sud-Américaines.
III. Notes sur des Chrysophyllees Américaines. *Adansonia*
1(1):26.
2. Aubréville, Andre.
1972. The botany of the Guyana Highland. IX. Sapotaceae.
Mémoires New York Bot. Gard. 23:223-224.
3. Baehni, Charles.
1965. Mémoires sur les Sapotacées. III. Inventaire des genres.
Boissiera 11:100-104.
4. Baehni, Charles, and Luciano Bernardi.
1970. Sapotaceae in Flora of Peru. *Field Mus. Nat. Hist.*
13(Part V-A, No. 3):148-149.
5. Cronquist, Arthur.
1946. Studies in the Sapotaceae. VI. Miscellaneous Notes.
Bull. Torrey Bot. Club 73:5:468.
6. Eyma, P. J.
1936. Notes on Guiana Sapotaceae. *Rec. Trav. Bot. Neerl.*
33:188-189.
7. Kukachka, B. F.
1979. Wood anatomy of the Neotropical Sapotaceae.
XII. Neoxythece. USDA For. Serv. Res. Pap. FPL 353. For.
Prod. Lab., Madison, Wis.

U.S. Forest Products Laboratory.

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