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WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE XVII. GAMBEYA.(U)
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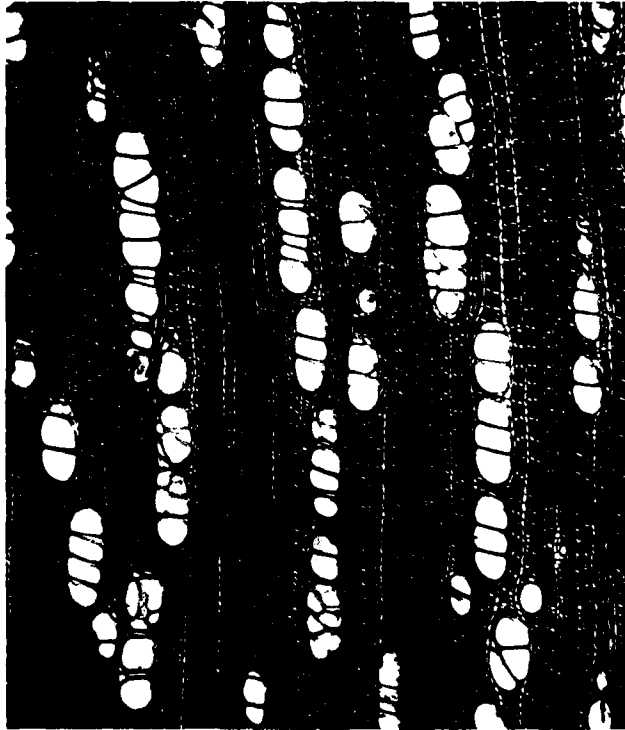
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**WOOD ANATOMY
OF THE
NEOTROPICAL SAPOTACEAE
XVII. GAMBEYA**

RESEARCH PAPER FPL 361

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

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Abstract

Gambeya is an African genus to which Aubréville added Gambeya excelsa (Huber) Aubr., based on the Amazonian Chrysophyllum excelsum Huber. Whether Gambeya is the appropriate taxon for the American species remains to be resolved. Wood specimens indicate that several species occur in the Americas ranging from Southern Mexico to the Peruvian Amazon. The woods of the neotropical Gambeya are an off-white color unique among the predominant browns and red browns so typical of the Sapotaceae. The wood is further distinguished by the radial arrangement of the pores, reticulate parenchyma, lack of silica, and the presence of microcrystals in the wood rays and axial parenchyma. A unique genus of the Sapotaceae.

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 Gambeya is the seventeenth 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--Res. Pap. FPL 325 | IX. Pseudoxythece--Res. Pap. FPL 350 |
| II. Mastichodendron--Res. Pap. FPL 326 | X. Micropholis--Res. Pap. FPL 351 |
| III. Dipholis--Res. Pap. FPL 327 | XI. Priourella--Res. Pap. FPL 352 |
| IV. Achrouteria--Res. Pap. FPL 328 | XII. Neoxythece--Res. Pap. FPL 353 |
| V. Calocarpum--Res. Pap. FPL 329 | XIII. Podoluma--Res. Pap. FPL 354 |
| VI. Chloroluma--Res. Pap. FPL 330 | XIV. Elaeoluma--Res. Pap. FPL 358 |
| VII. Chrysophyllum--Res. Pap. FPL 331 | XV. Sandwithiodoxa--Res. Pap. FPL 359 |
| VIII. Diploon--Res. Pap. FPL 349 | XVI. Paralabatia--Res. Pap. FPL 360 |

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.

Forest Service Research 1-13

WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE

XVII. GAMBeya

By 11-11-41

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U.S. Department of Agriculture

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Introduction

Gambeya was described by Pierre in 1891 to include a number of African species belonging to the genus Chrysophyllum. In 1960 Aubréville (1)^{1/} distributed the African species of Chrysophyllum among several genera including a number of new combinations in Gambeya. Although Gambeya is essentially African, Aubréville also made the new combination Gambeya excelsa (Huber) Aubr., based on the Amazonian Chrysophyllum excelsum Huber. In a later note (2) he indicated that there may be other American species. Baehni (3) retained Chrysophyllum excelsum but reduced the species of Gambeya to synonymy under Planchonella.

The African woods attributed to Gambeya differ from the Amazonian species in a number of significant details and hence would not easily be confused with the latter. Whether the name Gambeya has been correctly associated with the single American species up to this time is outside the scope of this paper and must remain for a monographer to decipher. However, for the lack of a better name, Gambeya is tentatively adopted here.

The wood of Gambeya excelsa is rather unique among the American Sapotaceae simply for its off-white color, a marked contrast to the drab browns and red browns which predominate in the neotropics. Utilizing the characteristics of Gambeya excelsa as a base, it became an easy matter to assemble a group of woods with similar characteristics ranging from southern Mexico to the Peruvian Amazon. It is also apparent that several species are represented in the Americas as had been suggested by Aubréville. Achrouteria durifructa W. Rodr., appears to be very closely allied to this group.

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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Description

Based on three specimens which were received as Chrysophyllum (Gambeya) excelsum and an additional nine specimens of which five were unknowns and four had been assigned to various species of Pouteria.

General: Wood uniformly off-white, without any apparent heartwood: moderately heavy with an average specific gravity of 0.62 (range 0.49 to 0.75). Growth rings faint, defined by a narrow zone of flattened wood fibers with associated parenchyma. Microcrystals, when abundant, may be detected by hand lens examination.

Anatomical:

Pores in radial arrangement which is almost perfect in IICA 195.

Pores mostly in radial multiples of 2-10; longer multiples as viewed with a hand lens will be found to consist of multiples separated by vascular tracheids. Maximum pore diameter of individual specimens ranges from 87 μm (Cooper 369) to 236 μm (Museum Goeldi Tree 720); in the other specimens generally between 134 μm and 173 μm (figs. 1-6).

Vessel member length averages 750 μm for all specimens; shortest in Pires 16040 (580 μm) and longest in Froes 80 (890 μm).

Intervessel pit diameters of 6 μm or 6-8 μm in most specimens. Perforations simple. Tyloses few; thin-walled. Microcrystals observed in the vessels of IICA 195.

Axial parenchyma typically reticulate (figs. 1-6); the cells characteristically without colored contents. Rhombic crystals lacking but microcrystals sparse to abundant in a given specimen. It should be noted here again that the microcrystalline masses may be dislodged during sectioning and subsequently lost during the slide-making procedure. It is highly desirable to check the section immediately after sectioning to ascertain the presence or absence of these highly characteristic crystals. Treating wood blocks with hydrofluoric acid (HF) will obviously destroy these delicate crystals.

Wood rays 1-4(5) seriate; heterocellular. Vertical fusions common. The maximum body height of the multiseriate portion ranges from 173 μm (Cooper 13 and 369) to 789 μm in Museum Goeldi Tree 920. Vessel-ray pitting irregular in shape and size; frequently linear. Ray cells characteristically without colored content. Microcrystals sparse to abundant (fig. 8) and confined to the erect or square marginal cells.

Wood fibers thin-walled; the fiber length averages for the different specimens range from 1.12 mm. to 1.66 mm with an overall average of 1.37 mm. Vascular tracheids present but may be quite sparse in some macerations.

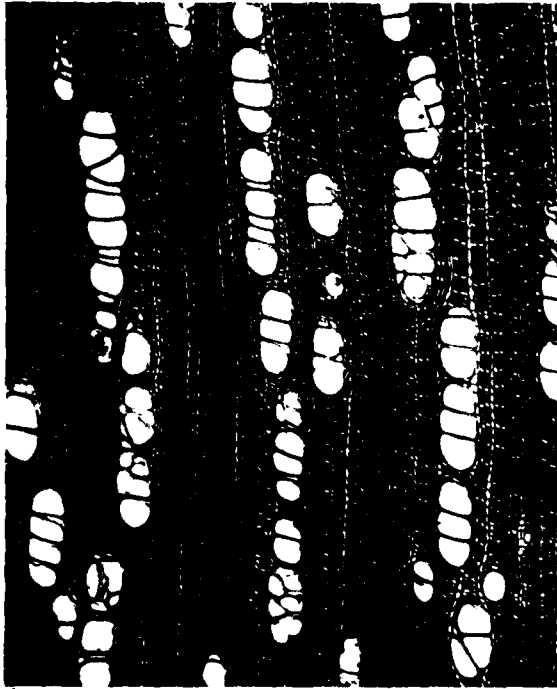
Silica considered to be absent since it was not detectable under the microscope. Chemical analysis provided values of 0.01 percent or less.

Diagnostic features: Wood off-white (a rare condition in the neotropical Sapotaceae). Pores in radial arrangement with reticulate parenchyma. Rays, cells, and parenchyma without colored contents but microcrystals may be present in either or both tissues of a given slide. Silica content minute and not detectable with a microscope.

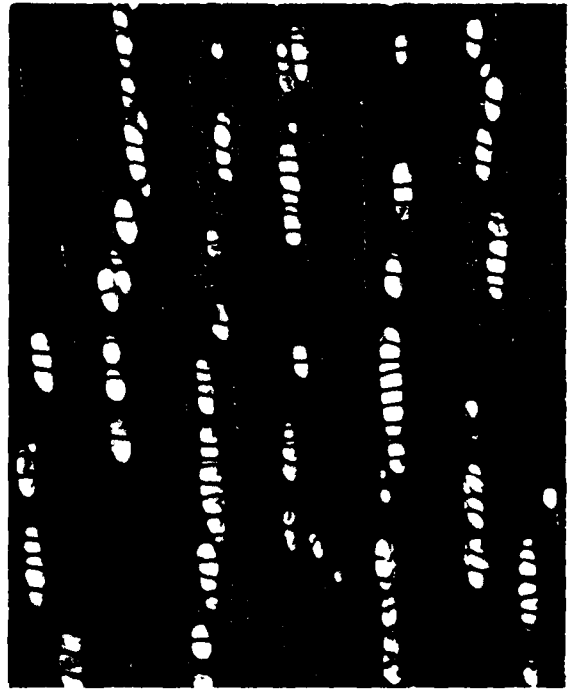
Table 1.--Specimens of Gambeya examined

Received as:	Collector and No.	Origin	Wood Collection No.
<u>excelsa</u> (Huber) Aubr.	Museum Goeldi tree 720	Brazil	MAD-22102
	Pires 16040	Brazil	MAD-22184
	Service Florestal s.n.	Brazil	SJR-38268
"congona"	?	Peru	MAD-7471
"mula muerta"	Curran 24	Venezuela	MAD-17705
sp.	IICA 195	Panama	MAD-24845
sp.	Froes 80	Brazil	A-27362
<u>Pouteria carabobensis</u> Pittier	Williams 10062	Venezuela	MAD-9854
<u>Pouteria lucentifolia</u> (Standl.) Baehni	$\frac{1}{2}$ /Cooper 13	Costa Rica	SJR-10473
	$\frac{2}{2}$ /Cooper 369	Panama	SJR-11962
<u>Lucuma speciosa</u> Ducke	Capucho 567	Brazil	MAD-20501
"chili-amate"	?	Mexico	MAD-30186

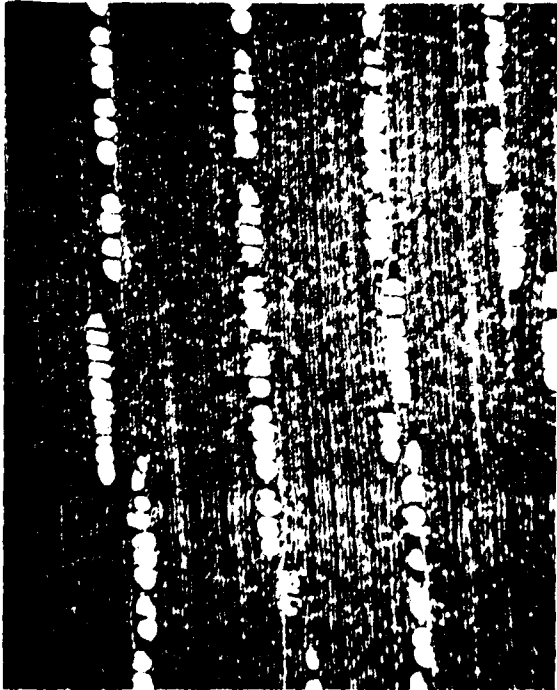
$\frac{1}{2}$ Cooper 13 is the type of Lucuma lucentifolia Standl.
 $\frac{2}{2}$ Cooper 369 is the type of Lucuma pentasperma Standl. reduced to synonym of lucentifolia by Cronquist.



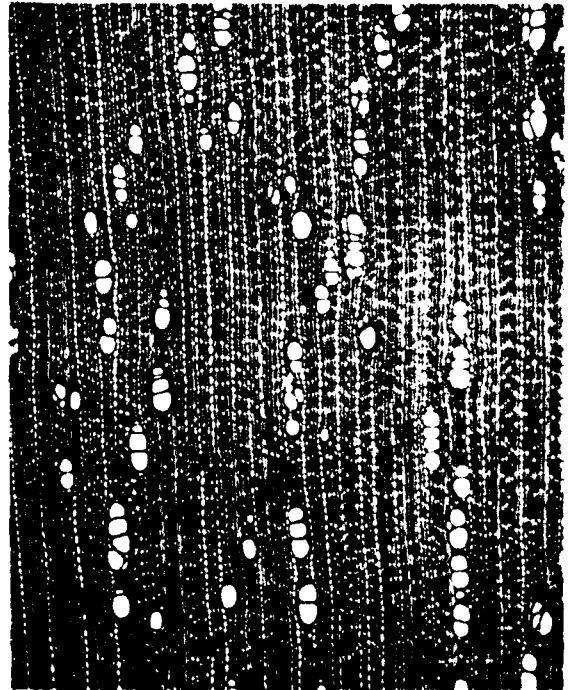
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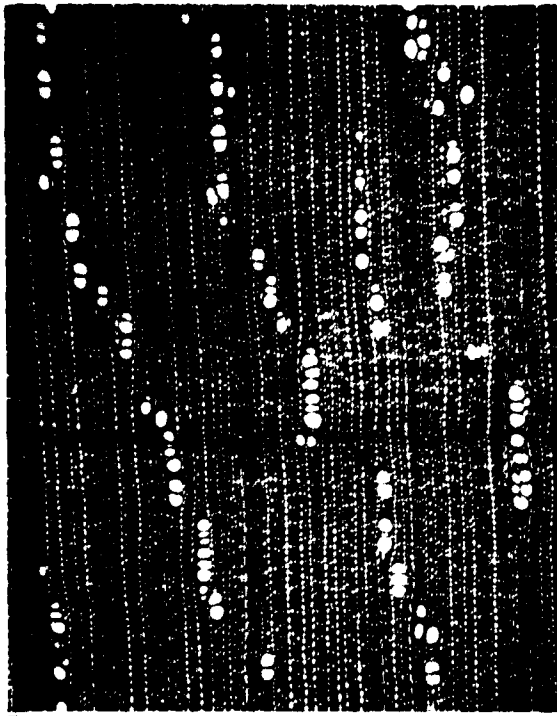
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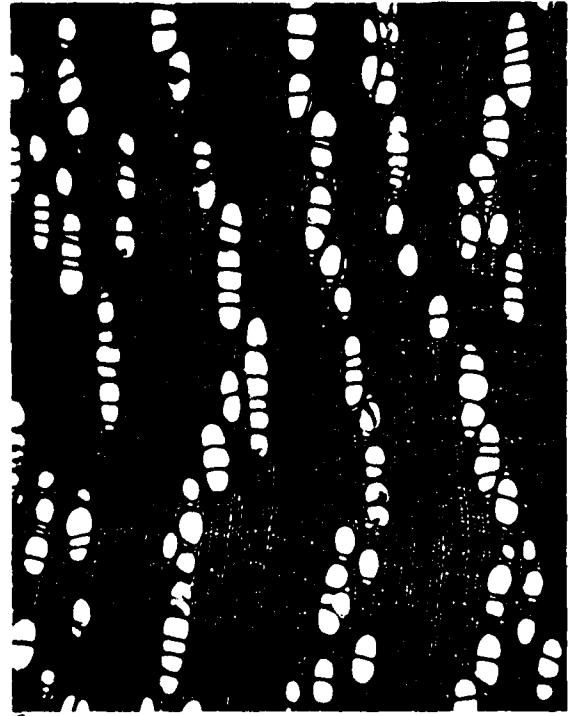
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Figures 1-6.--Variability in pore size, and pore arrangement:

1. Gambeya excelsa (Museum Goeldi tree 720); 2. G. excelsa (Pires 16040);
3. G. sp. (IICA 195); 4. G. excelsa (Servico Florestal); 5. G. sp.
(Cooper 369); 6. G. sp. (Froes 80). All X 30.



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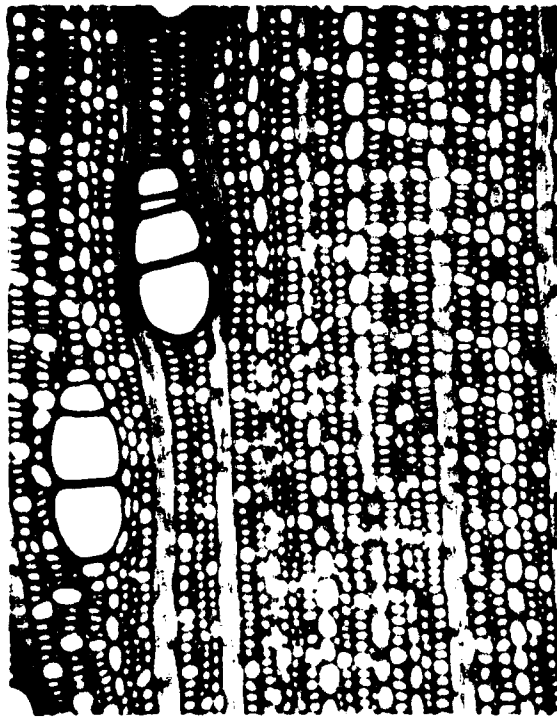


Figure 7.--*G. excelsa* (Servico Florestal) detail of parenchyma arrangement X 110.



Figure 8.--Same as figure 7 showing microcrystals in erect cells of wood rays (dark cells) X 30.

Literature Cited

1. Aubréville, Andre.
1960. Notes sur les Sapotacées de l'Afrique equatoriale.
Notulae Systematicae 16(3-4):248.
2. Aubréville, Andre.
1961. Notes sur des Chrysophyllees Americaines. Adansonia
1(1):33.
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Boissiera II:66-77.

U.S. Forest Products Laboratory.

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