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Edge-Notched Cards for the Identification of 30 Woods Traded in Colombia

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Abstract

Wood anatomical information on 30 of the most common commercial species of wood in Colombia is presented as a set of edge-notched cards designed for field wood identification. Wood specimens from the xylaria in the Center for Wood Anatomy Research of the Forest Products Laboratory—the Madison Wood Collection (MADw) and the Samuel J. Record Memorial Wood Collection (SJRw)—were used as references for the descriptions and imaging. The cards present macroscopic anatomical characteristics—such as vessel distribution, parenchyma types, and ray size and arrangement—and images of similar or confusable woods and characteristics to separate them. Edge-notched cards for wood identification are a reliable and simple analog tool. They are straightforward to use and can enhance the learning experience of wood identification for non-expert personnel. The card set is flexible and can be easily expanded by adding new cards. A print-ready PDF can be downloaded from the link on the Treesearch landing page for this publication: <https://doi.org/10.2737/FPL-RN-432>. The publication includes instructions in English and Spanish for printing and preparing the cards.

Keywords: wood identification, tropical woods, Colombia

Resumen

Información anatómica de las 30 especies de madera más comercializadas en Colombia se presenta en forma de un set de tarjetas perforadas diseñadas para la identificación de maderas en campo. Como referencia para las descripciones y las imágenes se utilizaron muestras de madera de las xilotecas del Centro de Investigaciones en Anatomía de la Madera del Laboratorio de Productos Forestales: Madison Wood Collection (MADw) y Samuel J. Record Memorial Wood Collection (SJRw). Las tarjetas presentan características anatómicas macroscópicas de cada especie—como la distribución de los vasos, los tipos de parénquima y el tamaño y la disposición de los radios—e imágenes de maderas con las que se puede confundir, así como características para diferenciarlas. Las tarjetas perforadas para la identificación de maderas son una herramienta analógica confiable y sencilla. Son fáciles de usar y pueden mejorar el aprendizaje de la identificación de maderas en personal no experto. Adicionalmente, el set de tarjetas es flexible y puede expandirse fácilmente añadiendo nuevas tarjetas. El set de tarjetas está disponible en formato PDF a través de un enlace en la página web de Treesearch para esta publicación: <https://doi.org/10.2737/FPL-RN-432>. La publicación incluye instrucciones en inglés y español para imprimir y preparar las tarjetas.

Palabras clave: identificación de maderas, maderas tropicales, Colombia

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Cover Photographs

Background: View of the Amazon Rainforest (licensed photo by pangamedia/AdobeStock). Foreground: Wood identification cards (Forest Service photo by Joshua M. Limbaugh).

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Overview

To assist in the control and regulation of timber trade and wood products around the world, technological tools such as traceability systems, wood identification programs and applications, and computer vision-based methods have been developed in recent years (see Spessert et al. 2025 for a summary of computer-aided wood identification programs). Still, there is a need for hands-on tools that facilitate the identification of wood in the field and help train customs inspectors and other personnel responsible for the monitoring and control of forest products supply chains. Of the available tools and technologies, wood anatomy remains the most practical, economical, and accessible approach to identify woods in the field (UNODC 2016), whether using field manuals (CITES n.d.), online databases (Koch et al. 2015), or other resources (Schmitz 2020).

A wood identification technology used in the past involves edge-notched or edge-punched cards. A simple analog tool, the cards allow efficient selection of specific, encoded criteria using a needle or probe to physically separate them (Bryan 1966, Williams 2002). Each card represents an item with its unique set of attributes (e.g., a species of wood with its macroscopic features for identification). Circular holes placed at specific intervals near the edge(s) of the cards allow binary data (e.g., the presence or absence of discrete macroscopic wood anatomical features useful for wood identification) to be encoded via the presence or absence of notches. To select wood species with a particular feature, a needle or probe is passed through the stack of cards at the hole corresponding to that attribute. The cards with notches at that location bear the selected attribute and will fall out of the stack as the probe extracts cards without notches. Multiple steps are used to implement “and” “or” selection of wood anatomical features, progressively eliminating those woods that lack them and ultimately resulting in one or a few cards of possible wood species.

Edge-notched cards for wood identification facilitate rapid, progressive sorting and retrieval of candidate species by allowing users to apply multiple criteria. Compared to traditional wood identification keys, the cards are more compact and efficient, are easier to use by non-expert personnel, and can be expanded to include more species simply by adding new cards (Bryan 1966, McKinney 2022).

Identification Cards for 30 Colombian Woods

We designed a wood identification edge-notched card system for the 30 most common commercial woods in Colombia (Table 1). Species selection was based on the list of the most harvested timber species from natural forests in Colombia (Blanco-Flórez 2020). Wood specimens from the xylaria in the Center for Wood Anatomy Research of the U.S. Department of Agriculture, Forest Service, Forest Products Laboratory—the Madison Wood Collection, (MADw) and the Samuel J. Record Memorial Wood Collection (SJRw)—were used as references for the descriptions and imaging.

Table 1.—Species list giving the scientific and common names of 30 common commercial woods from natural forests in Colombia and included in the edge-notched wood identification card set

Species name	Common name
<i>Anacardium excelsum</i> (Bertero & Balb. ex Kunth) Skeels	caracolí, espavé
<i>Brosimum utile</i> (Kunth) Oken	sande, lechero
<i>Calophyllum brasiliense</i> Cambess.	aceite maria
<i>Camposperma panamense</i> Standl.	sajo
<i>Carapa guianensis</i> Aubl.	güino, tangaré
<i>Cariniana pyriformis</i> Miers	abarco
<i>Cedrela odorata</i> L.	cedro
<i>Cedrelinga cateniformis</i> (Ducke) Ducke	achapo, cedro achapo, tornillo
<i>Clathrotropis brachypetala</i> (Tul.) Kleinhoonte	sapán
<i>Cordia alliodora</i> (Ruiz & Pav.) Oken	moho, nogal cafetero
<i>Couma macrocarpa</i> Barb.Rodr.	perillo
<i>Dipteryx oleifera</i> Benth.	choibá
<i>Erisma uncinatum</i> Warm.	milpo
<i>Ficus insipida</i> Willd.	higuerón
<i>Goupia glabra</i> Aubl.	chaquiro
<i>Huberodendron patinoi</i> Cuatrec.	carrá
<i>Humiriastrum procerum</i> (Little) Cuatrec.	chanul
<i>Hymenaea oblongifolia</i> Huber	algarrobo
<i>Jacaranda copaia</i> (Aubl.) D.Don	chingalé
<i>Myroxylon balsamum</i> (L.) Harms	bálsamo
<i>Otoba gracilipes</i> (A.C.Sm.) A.H.Gentry	otobo
<i>Pouteria caimito</i> (Ruiz & Pav.) Radlk.	caimo
<i>Prioria copaifera</i> Griseb.	cativo
<i>Samanea saman</i> (Jacq.) Merr.	samán
<i>Schizolobium parahyba</i> (Vell.) S.F.Blake	tambor
<i>Simarouba amara</i> Aubl.	tara
<i>Symphonia globulifera</i> L.f.	machare, tometo
<i>Tabebuia rosea</i> (Bertol.) DC.	roble, flormorado
<i>Vatairea guianensis</i> Aubl.	amargoso, maqui
<i>Virola reidii</i> Little	virola

Accessing the Wood Identification Cards File

The edge-notched wood identification cards are available as a print-ready PDF from the link found on the Treesearch landing page for this publication: <https://doi.org/10.2737/FPL-RN-432>. The file includes the following:

- Glossary
- Explanations of the wood anatomical features used for identification and encoded in the cards
- Instructions on wood specimen preparation for hand lens observation and use of the hand lens
- Directions for using the cards for the identification of the wood species
- The wood-descriptive cards, which include the macroscopic wood anatomical features encoded on each card (i.e., vessel distribution, parenchyma types, and ray size and arrangement) and an anatomical description, high-resolution end-grain macroscopic images, and similar or confusable woods along with the characteristics that differ between the woods

Preparing the Wood Identification Cards for Use

Instructions for how to print and cut the wood identification cards follow in English and Spanish. The steps involved in printing, cutting, and notching the cards prior to use provide hands-on experience in managing the information, and the process is intended to reinforce concepts and wood identification skills.

What you will need:

- Color printer that can print double-sided
- Scissors or precision knife
- Hole punch
- Straight edge, such as a ruler

Step 1: Print the cards

1. Use 8.5 by 11 in. (21.6 by 27.9 cm) white card stock; 100 lb/270 gsm cover stock or 140 lb/253 gsm index stock are recommended.
2. Print “actual size” (do not shrink, fit, or scale), “double-sided,” and “full color.”

Lo que se necesita:

- Impresora a color que pueda imprimir a doble cara
- Tijeras o cortador de precisión
- Perforadora de papel de un solo orificio
- Instrumento con borde recto como una regla

Paso 1: Impresión de las tarjetas

1. Utilizar papel de cartulina blanca de 8.5 por 11 pulg. (21.6 por 27.9 cm); se recomienda cartulina opalina blanca o cartulina de impresión superfin de un gramaje superior a 250 gr.
2. Asegurarse de imprimir en “tamaño real” (no reducir, ni ajustar escala), a “doble cara” y a “todo color.”



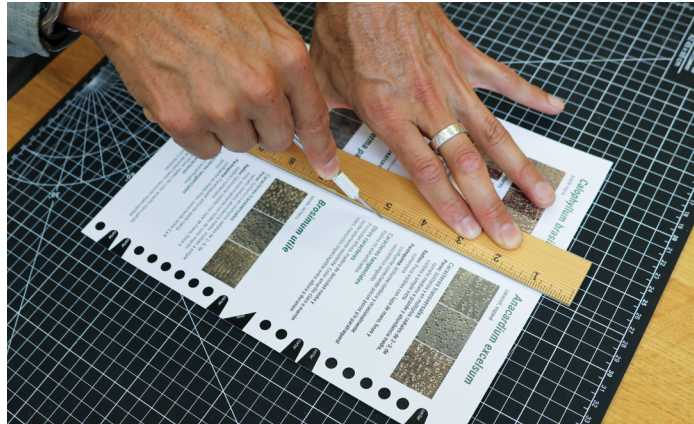
What you will need/Lo que se necesita. Forest Service photo by Joshua M. Limbaugh.

Step 2: Cut the cards using scissors or a precision knife

1. Cut vertically down the center.
2. Cut horizontally across the middle.
3. Remove black triangular notch in front upper-right corner.

Paso 2: Cortar las tarjetas utilizando tijeras o un cortador de precisión

1. Cortar verticalmente por el medio siguiendo las líneas punteadas.
2. Cortar horizontalmente por la mitad siguiendo las líneas punteadas.
3. Cortar la muesca triangular negra de la esquina superior derecha delantera.



Step/Paso 2.1. Forest Service photo by Joshua M. Limbaugh.



Step/Paso 2.2. Forest Service photo by Joshua M. Limbaugh.



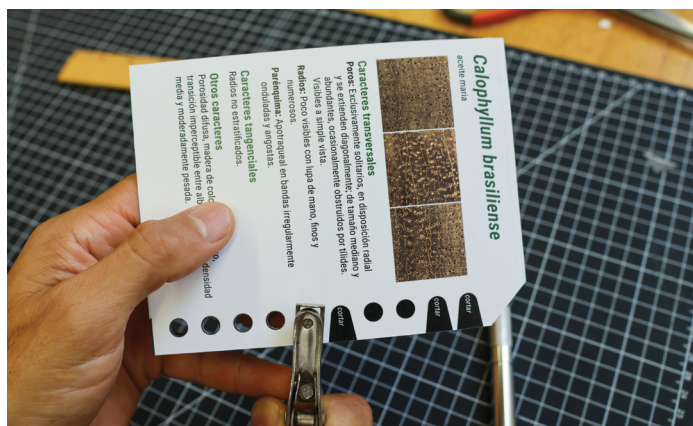
Step/Paso 2.3. Forest Service photo by Joshua M. Limbaugh.

Step 3: Cut out notches

1. Use the hole punch to remove every solid black circle ● on the right side of each card.
2. Remove every black notch  on the side of each card. A hole punch is ideal for removing the rounded left edge. Finish by using scissors or a precision knife to remove the straight edges on the top and bottom of each notch.

Paso 3: Recortar perforaciones y muescas

1. Remover todos los puntos negros ● ubicados en el lado derecho de la cara frontal de cada tarjeta utilizando la perforadora de papel.
2. Remover todas las muescas negras  ubicadas en el lado derecho de cada tarjeta: con la perforadora de papel, perfore el borde izquierdo redondeado de la muesca; con tijeras o un cortador de precisión, corte los bordes rectos de la parte superior e inferior de cada muesca.



Step/Paso 3.1. Forest Service photo by Joshua M. Limbaugh.



Step/Paso 3.2. Forest Service photo by Joshua M. Limbaugh.

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