Pl@ntWood: A computer-assisted identification tool for 110 species of Amazon trees based on wood anatomy

Carolina Sarmiento, Christine Heinz, Pierre Détienne, Pierre Bonnet

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Carolina Sarmiento[1,3], Christine Heinz[1], Pierre Détienne[2] and Pierre Bonnet[1]

Tropical forests are threatened by habitat degradation and timber trade, among other factors. There is a need for accesible identification tools with sustainable management and conservation purposes.

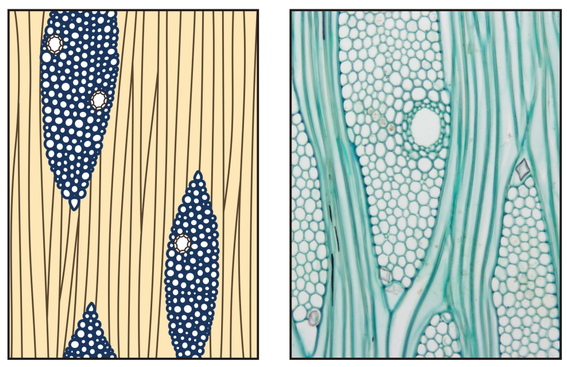
Wood anatomy provides a considerable amount of information that can be used only for experts to plant species identification.

Here, we propose an interactive tool based on wood anatomical features for identification of tropical tree species.

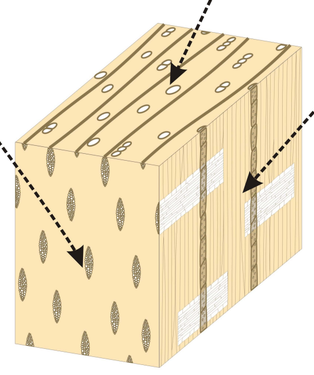
Methodology

1. Data matrix: 110 Amazon tree species **x** 22 anatomical features (96 states), selected from the IAWA List of microscopic features for hardwood identification (1989)[4].
2. After light microscopy observations, digital photographies were made for all species and selected features.
3. Using CorelDRAW X4 (version 14.0), vector graphics were made for all characters and their states.
4. The IDAO approach was used to build identikit images (similar to face recognition systems).

Tangential section

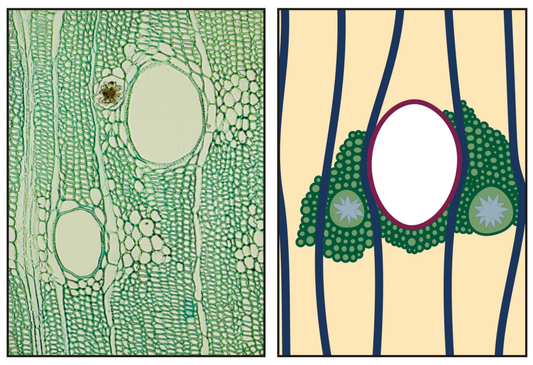


Radial canals - *Spondias mombin*

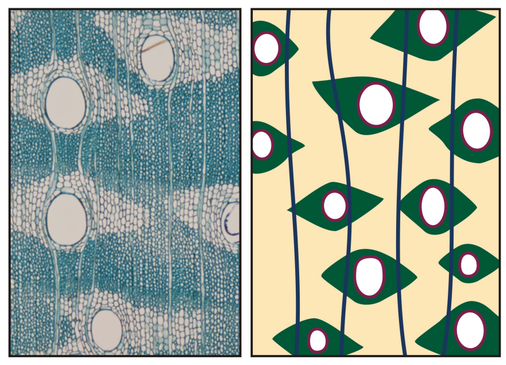


Vector Graphics

Cross section

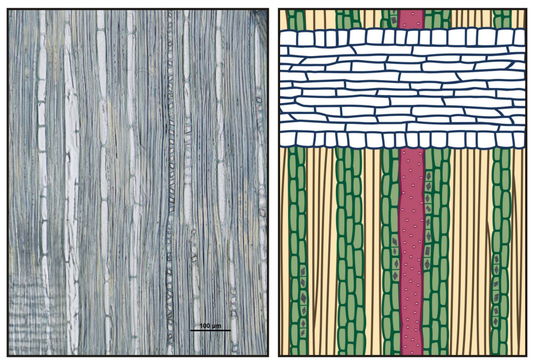


Druses in axial parenchyma cells - *Terminalia catappa*

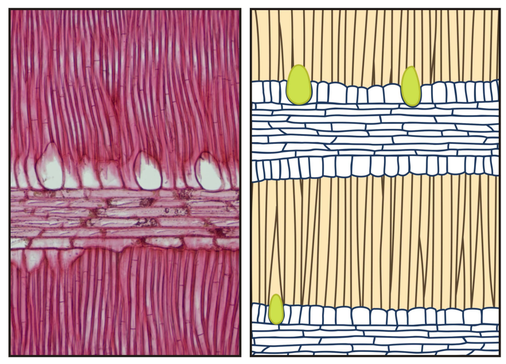


Axial parenchyma aliform - *Ormosia paraensis*

Radial section



Prismatic crystals in chambered axial parenchyma cells - *Lecythis pisonis*

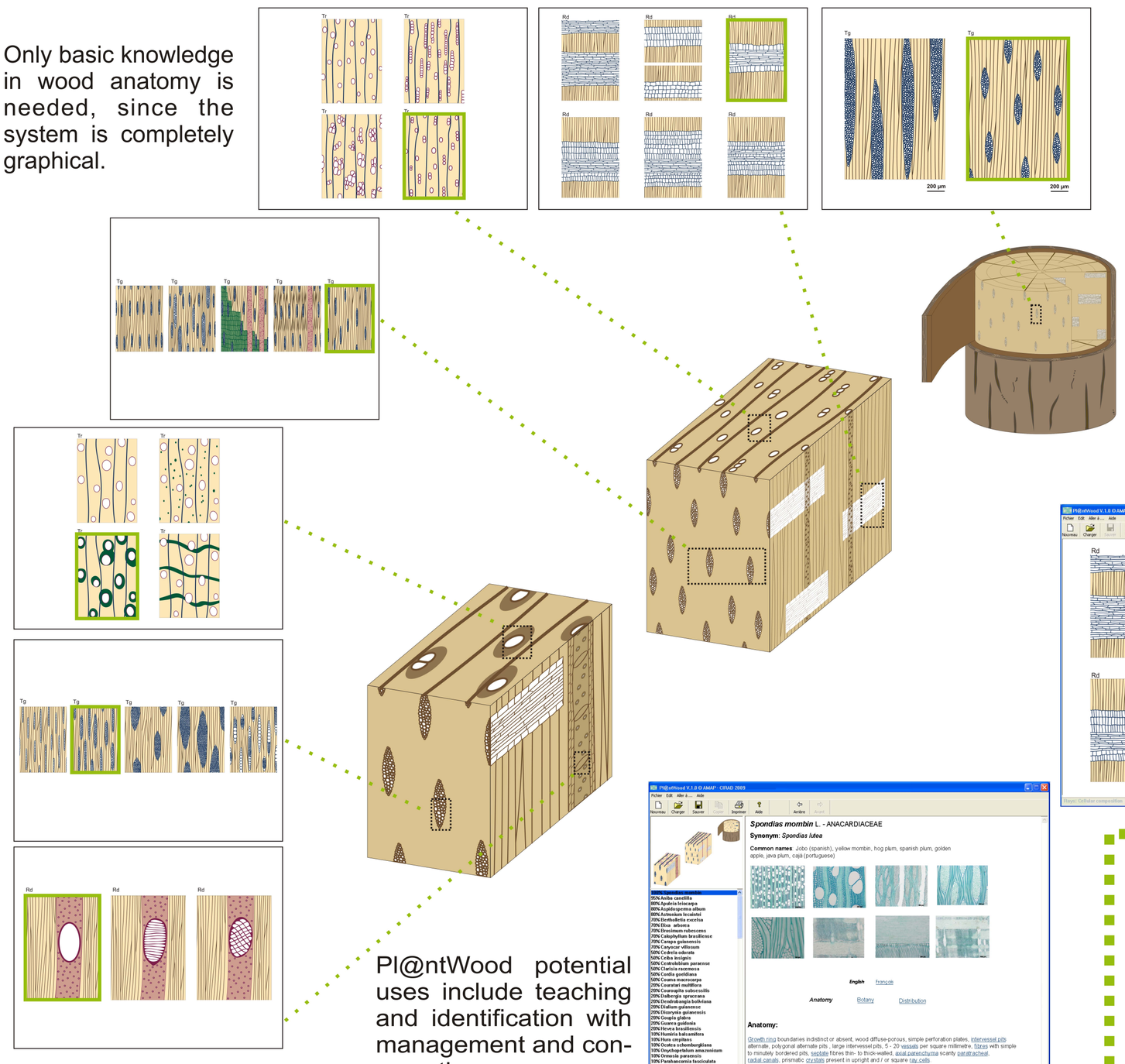


Oil and / or mucilage cells associated with ray parenchyma - *Ocotea schomburgkiana*

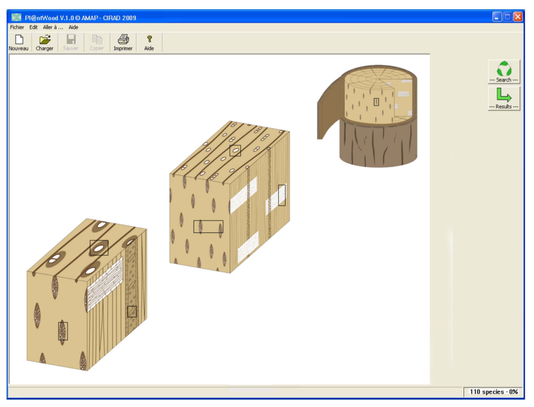
IDAO
(*Identification des Plantes Assistée par ordinateur*)

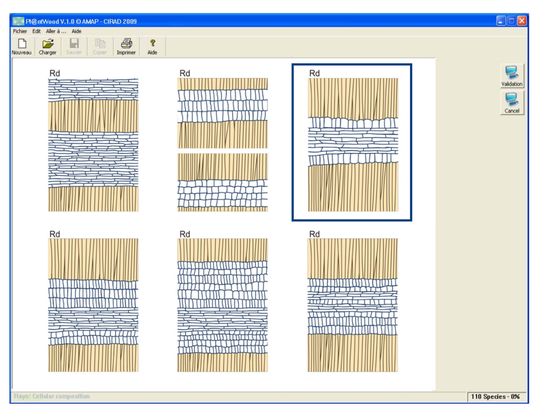
Graphical identification approach that enables the user to select character-states from a set of vector illustrations. Wood anatomical characters are choosen by the user from three different sections and magnifications. When the user selects the characters that best match his wood sample, an identikit image of the wood is shown. This system is based on the calculation of similarity coefficients, allowing missing information or some observational errors.

Only basic knowledge in wood anatomy is needed, since the system is completely graphical.



The wood identikit image is updated after user selections. The user can access a descriptive sheet for each species with images and a description of its wood.





Pl@ntWood will be available on-line (SVG format), in CD-ROM, and will be also adaptable to mobile devices for field work.

Pl@ntWood potential uses include teaching and identification with management and conservation purposes.

*Pl@ntWood is a case study of the project Pl@ntNet, funded by Agropolis Fondation

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[4]Wheeler E. A., P. Baas and P. E. Gasson (eds.). 1989. IAWA list of microscopic features for hardwood identification. IAWA Bull. 10:219–332.

For further information:

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