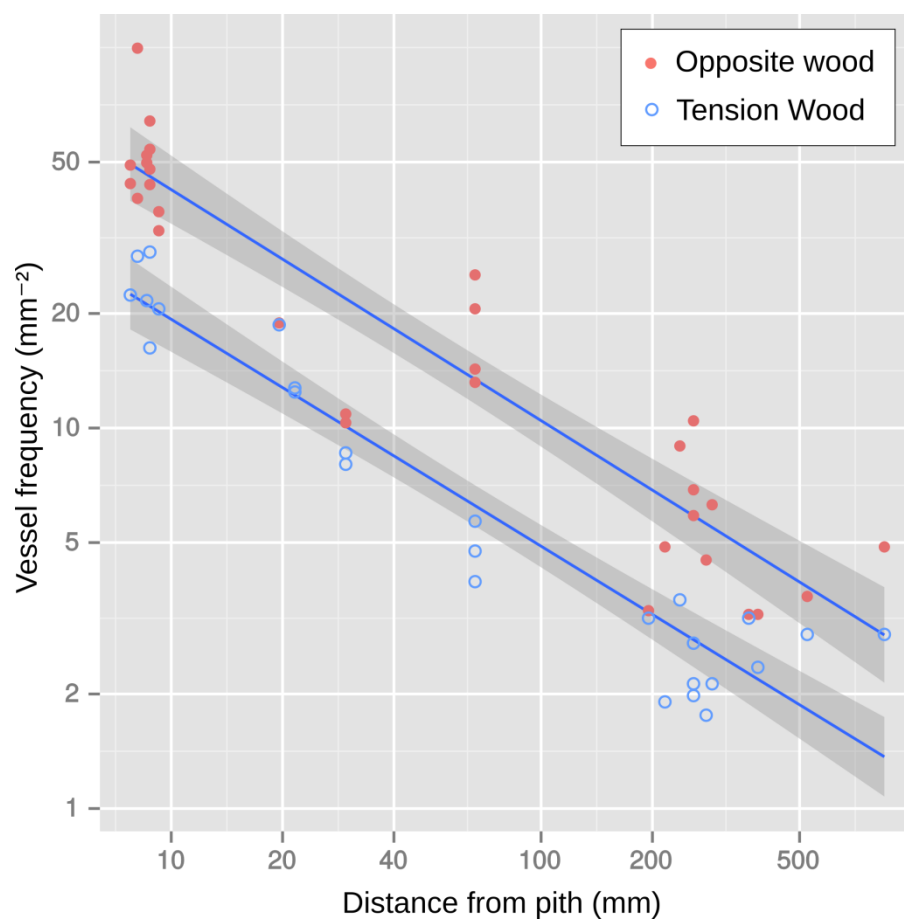


## Supplementary material

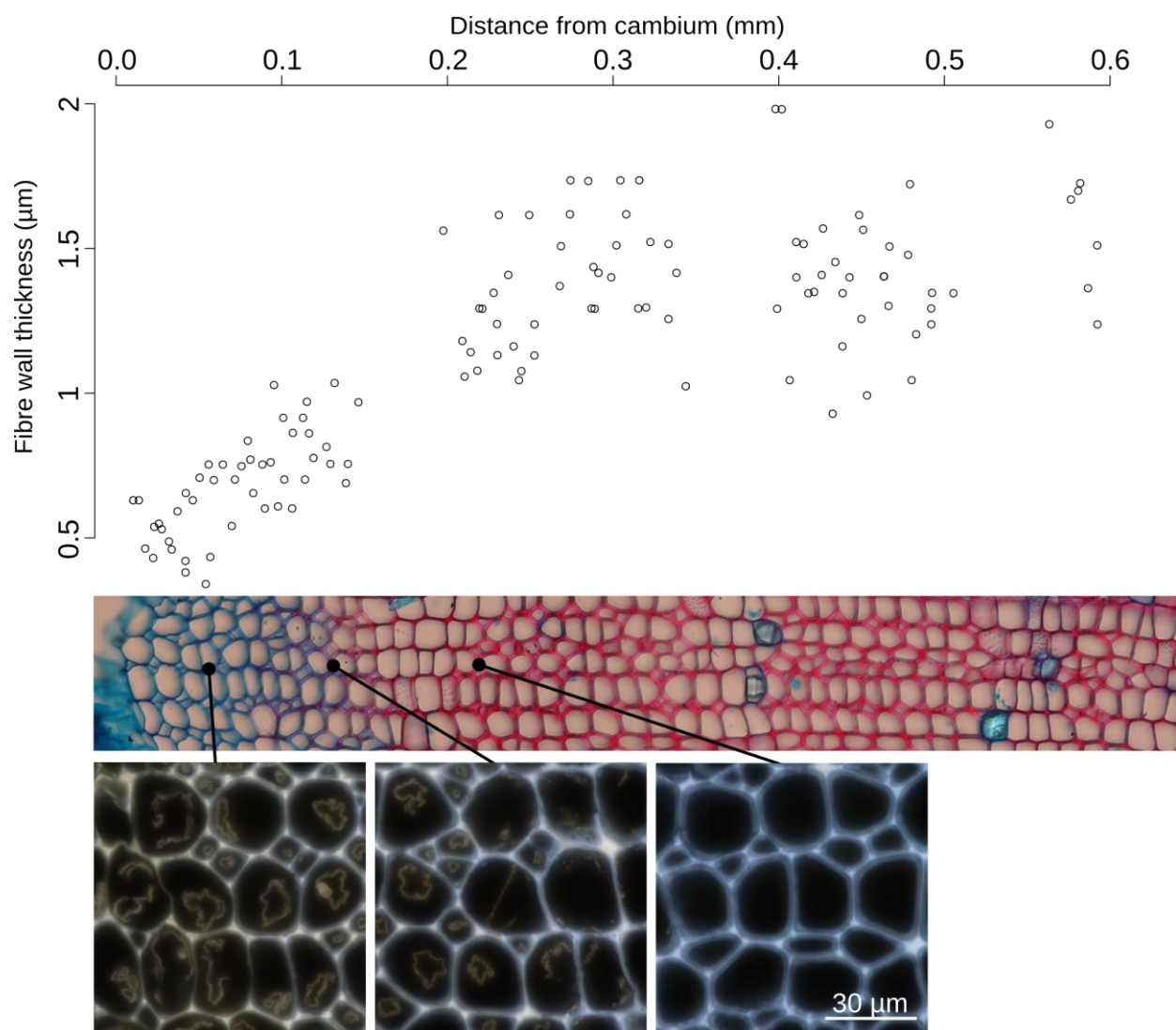
### Evidence of the late lignification of the G-layer in *Simarouba* tension wood, to assist understanding how non-G-layer species produce tensile stress

Jean-Romain ROUSSEL and Bruno CLAIR

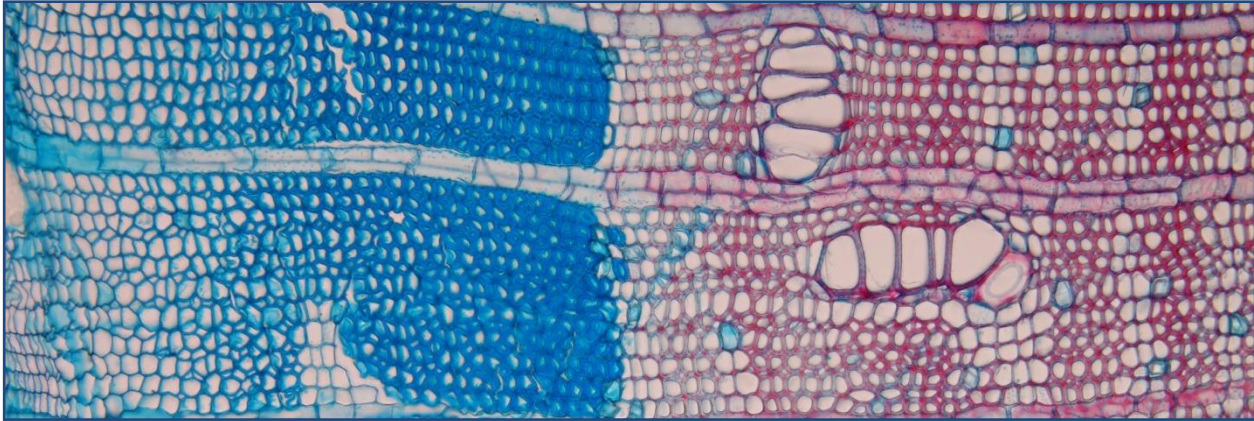
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**Figure S1.** Vessel frequency measured in tension wood (blue square) and in the opposite wood (red circles) of 19 *Simarouba amara* trees from seedlings to adult trees. Vessel frequency is plotted as a function of the distance to the pith to clarify the link with ontogeny and to evidence the lower frequency in the tension wood compared to normal wood in a given class of diameter.



**Figure S2.** Normal wood of *Simarouba amara* observed in saplings maintained in an upright position ( $0^\circ$ ). Fibre wall thickening, microscopic observation of the semi-thin section after double-staining with Safranin/Alcian blue and the thin cross-sections observed under UV light indicate that lignification occurs all along the cell wall thickening.



**Figure S3.** Transition from normal wood formed before tilting (right) to tension wood formed after tilting (left) observed in saplings of *Simarouba amara* tilted at 60° for 60 days. Double-staining with Safranin/Alcian blue. Images width: 1100  $\mu\text{m}$ .



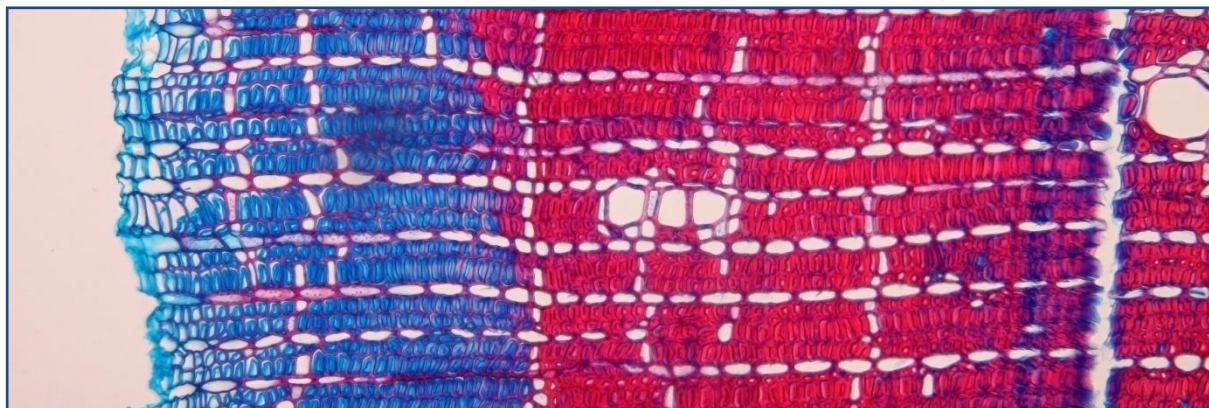
**Figure S4**



Apocynaceae *Tabernaemontana-undulata*

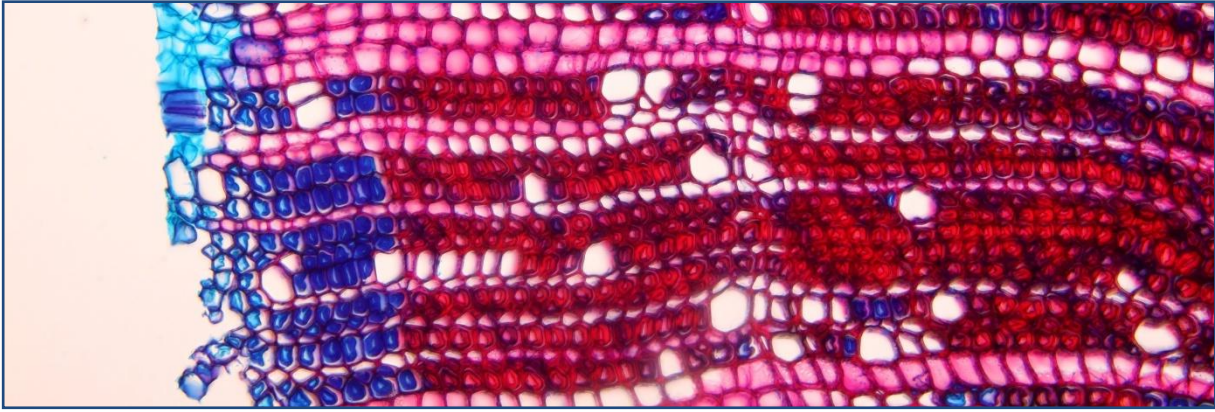


Apocynaceae

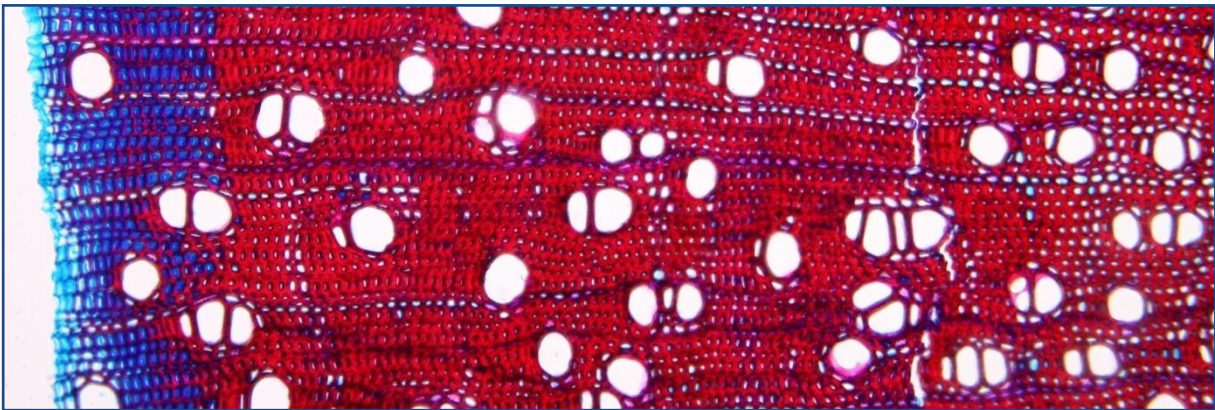


Euphorbiaceae *Sandwithia guyanensis*

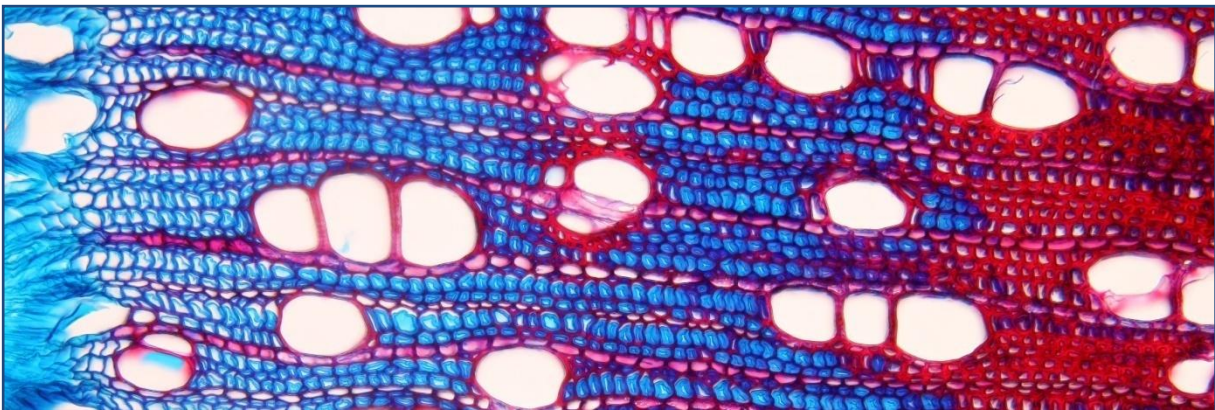




Lacistemataceae *Lacistema*



Melastomataceae



Salicaceae *Banara guianensis*

**Figure S4.** Observation with bright field microscopy after double-staining with Safranin/Alcian blue of the formation of tension wood cell-wall in six species sampled on naturally tilted seedlings in a tropical rain forest (Piste de St Elie research station, French Guiana). In these species, a classical G-layer is formed and later lignified during the maturation process. In some species, some cells remain partly unlignified. The number of cells in the G-layer stage depends on the growth rate of the tree at the sampling date. Images width: 1100  $\mu\text{m}$ .