Special Issue

The Functional Anatomy of Tree Xylem: From Cell Structure to Ecological Roles

Message from the Guest Editor

The secondary xylem, or wood, forms through a complex process. It involves cambial cell divisions, the growth of cambial cell derivatives, secondary cell wall deposition, lignification, and is finalized by the autophagy of xylem cell cytoplasm. In trees, phytohormones and environmental signals interact to drive wood formation. The structure of secondary xylem encodes environmental history. It is simpler in conifers and more intricate in dicotyledonous trees. Analyzing the functional anatomical traits of secondary xylem helps us understand the environmental conditions and stresses during tree growth. The alignment between the structure–function relationships of secondary xylem and environmental needs makes it a crucial tissue in ecological research, especially in the context of climate change. As a long-lived tissue, secondary xylem not only plays major physiological roles in water transport and mechanical support but also acts as a carbon sink. Therefore, we aim to invite contributions that use wood anatomy to study forest dynamics under climate change, fire history, or insect outbreaks.

Guest Editor

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