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Resin duct characteristics in the wood of fire-scarred North American conifers

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Traumatic resin ducts form in xylem and phloem tissue of conifers in response to abiotic wounding, fungal invasion, and insect attack. Little is known about resin duct characteristics in the wood of fire-scarred trees. The aim of this study is to quantify changes in traits of both axial and radial resin ducts, along with those of associated epithelial cells and fusiform rays, in 2 individuals each of *Larix occidentalis* and *Pseudotsuga menziesii*. Transverse and tangential microsections were cut from samples for light microscopy. Using image analysis, anatomical measurements of cells are being performed three-dimensionally: at 4 heights along the tree axis, within 4 cm from the wound margin and in different rings, including 2 rings from the wound xylem. The forthcoming results will provide new insights into one of the most important defense mechanisms of trees.

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Fire History in Madrean Sky Islands

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Pine forests of the Southwestern United States were characterized historically by high-frequency low-severity surface fire events evident in the tree-ring record. Twentieth century fire suppression has disrupted these fire regimes in US forests leading to recent unprecedented fire severity and behavior across the Western US. Forests of Northwestern Mexico are similar in both species composition and climate to Southwestern US forests, however land management and historical practices are different. We have characterized fire regimes across five sites ranging from the northern extent of the Sierra Madre in Eastern Sonora, to the Madrean Archipelago of sky islands across the US-Mexico border. Presence of frequent 20th century fire provides a unique opportunity to characterize modern fire regimes in context with climate change. These sites provide a needed proxy for understanding fire regimes, forest resilience and climate change across the western US in forests analogous to historic ecosystems.