Sierra sequoias respond to water stress

By Robert Kuo, Sacramento Bee

The leaves atop giant sequoias in the Sierra Nevada are better at storing water than those closer to the ground, an adaptation that may explain how their treetops are able to survive 300 feet in the air, researchers at American River College and Humboldt State University have found.

“It can take over a week for water to get from the ground to the top of the tree,” says Alana Chin, who led the study and is an instructor at American River College in Sacramento. “When you’re that tall of a tree, you’re under tremendous water stress.”

Chin and her colleagues used ropes to climb the trees and collect samples. They found that leaves higher up the tree have less surface area and more transfusion tissue compared to leaves near the trunk. These traits give leaves more succulence, or ability to store water, which serves as a buffer against a water deficit that would otherwise damage the shoot system.

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