Oldest Living Tree Found In Sweden

James Owen - National Geographic News

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The world's oldest known living tree, a conifer that first took root at the end of the last Ice Age, has been discovered in Sweden, researchers say.

The visible portion of the 13-foot-tall (4-meter-tall) "Christmas tree" isn't ancient, but its root system has been growing for 9,550 years, according to a team led by Leif Kullman, professor at Umeå University's department of ecology and environmental science in Sweden.

Discovered in 2004, the lone Norway spruce—of the species traditionally used to decorate European homes during Christmas—represents the planet's longest-lived identified plant, Kullman said.

The researchers found the shrubby mountain survivor at an altitude of 2,985 feet (910 meters) in Dalarna Province.

The tree's incredible longevity is largely due to its ability to clone itself, Kullman said.

The spruce's stems or trunks have a lifespan of around 600 years, "but as soon as a stem dies, a new one emerges from the same root stock," Kullman explained. "So the tree has a very long life expectancy."

Radiocarbon Dating

Bristlecone pines in the western United States are generally recognized as the world's oldest continuously standing trees.

The most ancient recorded, from California's White Mountains, is dated to around 5,000 years ago.

Bristlecone pines are aged by counting tree rings, which form annually within their trunks.

But in the case of the Norway spruce, ancient remnants of its roots were radiocarbon dated.

The study team also identified other ancient spruces in Sweden that were between 5,000 and 6,000 years old.

Trees much older than 9,550 years would be impossible in Sweden, because ice sheets covered the country until the end of the last Ice Age around 11,000 years ago, Kullman noted.

March of the Trees

The research forms part of an ongoing study into how and when trees colonized Scandinavia after it had thawed.

"Prior to our studies the general conception was that spruce migrated to this area about 2,000 years ago, so now you will have to rewrite the textbooks," Kullman said.

"Deglaciation seems to have occurred much earlier than generally thought," he added. "Perhaps the ice sheet during the Ice Age was much thinner than previously believed."

The tree study may also help shed light on how plants will respond to current climate change, Kullman said.

"We can see trees have an ability to migrate much faster than people had believed," he said.

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In fact, global warming made the ancient mountain conifers easier for the study team to find.

"For many millennia they survived in the mountain tundra as low-growing shrubs perhaps less than a meter high," Kullman said. "Now they are growing up like mushrooms—you can see them quite readily."

Rising Timberline

But climate change could also swamp these living Ice Age relics, he warned.

The treeline has climbed up to 655 feet (200 meters) in altitude during the past century in the central Sweden study area, the team found.

"A great change in the landscape is going on," Kullman said. "Some lower mountains which were bare tundra less than a hundred years ago are totally covered by forest today."

Mountains tend to provide a refuge for the planet's most venerable trees because of reduced competition from neighbors and other plants and because the sparser vegetation around the timberline is less vulnerable to forest fires, Kullman said.

Another factor is reduced human impacts such as logging, said Tom Harlan of the Laboratory of Tree-Ring Research at the University of Arizona.

"Human activity lower down has demolished all sorts of things that could have been extremely old," he said.

Harlan says the newly dated Swedish spruce trees have "quite an extraordinary age."

"I have no great problems with them having a tree which has been growing there for more than 8,000 years," he said. "The date seems a little early but not out of line with other things we have seen."

For instance, Harlan noted, dead remains of Californian bristlecone pines dating to about 7,500 years ago have been found up to 500 feet (150 meters) higher in altitude than any living bristlecones.

"So there was a time period then when trees were pushing aggressively into areas they had not been in before," he said.

Other tree clones may have an even more ancient lineage than the Swedish spruces, he added.

Research suggests that stands of Huon pines on the Australian island of Tasmania possibly date back more than 10,000 years.