

Magi would have a tough time finding frankincense

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(RNS) The world may still have gold and myrrh, but it's quite possible that frankincense could become a thing of the past, given ecological pressures on the arid lands where it grows in Ethiopia.

The storied resin -- known to millions as one of the three gifts of the Magi, the wise men who visited Jesus after his birth -- is made from gum produced by the *boswellia papyrifera* tree. Its "bitter perfume" is used as incense in religious rituals in many cultures, as well as an ingredient in perfume and Chinese traditional medicine.

Dutch and Ethiopian researchers studying populations of the scraggly, scrublike trees in northern Ethiopia found that as many as 7 percent of the trees are dying each year, and seedlings are not surviving into saplings.

Their paper in Tuesday's (Dec. 20) edition of the *Journal of Applied Ecology* finds that the Ethiopian trees that produce much of the world's frankincense are declining so dramatically that production could be halved over the next 15 years, and the trees themselves could decline by 90 percent in the next 50 years.

Frankincense has been harvested in the wild in the Middle East and the Horn of Africa since ancient times.

The frankincense carried by the three wise men probably came from that area but those trees are mostly gone, said Frans Bongers, a professor of tropical forest ecology and management at the University of Wageningen in Holland.

"There's still some in Somalia, but no one knows how much. The main production area in the world right now is Ethiopia," said Bongers, who has studied the trees for the past six years.

Specialists have long said frankincense trees aren't doing well, but the paper is the first hard data on them, and the outlook is not good.

Frankincense is harvested by making cuts in the tree bark during the dry season. A cut is made every two or three weeks, and the resin that emerges to heal the tree is collected.

How much frankincense is produced worldwide isn't clearly known. Bongers said Europe imports about 400 tons each year, and about half of that goes on to China for use in traditional medicine while the rest goes to churches and perfume makers.

Most of that comes from Ethiopia. A long-term government push to relocate people from the highlands to the lowlands, where the trees grow, is putting tremendous pressure on the ecosystem.

Additionally, a shift in harvesting from large, government-controlled companies to private collectives has increased the pressure to collect larger amounts of resin. The old contracts were for up to 40 years, Bongers said, which gave incentive to preserve the resource. The new contracts can be as short as two years, "so they get what they can get," he said.

Heavy tapping appears to weaken the trees, making them more prone to attacks by longhorn beetles. Up to 85 percent of fully grown trees that die are heavily infested with beetles, the researchers found.

No new trees are replacing them. The highlanders brought cattle, and seedlings don't survive to become saplings because cattle eat them and collectors burn the grasslands to make it easier to get to the trees, killing saplings as well, Bongers said.

An Arizona man is trying to stem this tide. Jason Eslamieh, originally from Iran, grows and sells all 19 *boswellia* species, including the frankincense-producing type, at his nursery in Tempe.

Seeds from the *papyrifera* subspecies, which makes frankincense, are notoriously difficult to germinate. Only two to eight out of a hundred grow into a plant, said Eslamieh, who authored a book on the topic. He says they must have undergone a population bottleneck due to overharvesting in the past, leaving them inbred and weak. He's trying to create hybrids that are more vigorous.

His nursery, Miniatree.com, sells more than 100,000 seeds a year as well as 1,000 papyrifera plants. A 4-inch seedling costs \$55, and fully mature trees can sell for up to \$1,000.

The trees grow readily in Southern California, Florida and parts of Arizona.

Once the trees are about 4 years old, they can be tapped for frankincense. "A small tree is enough for personal use," he said.

It's possible that climate change is affecting the trees. Bongers has a research project underway and hopes to have an answer within two years.