

# Frankincense trees overexploited for Christmas scent

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Current rates of tapping frankincense - which according to the Bible was given to the baby Jesus by the three wise men at Christmas and which will feature in thousands of Nativity plays in coming days - are endangering the fragrant resin's sustained production, ecologists have warned. Writing in the December issue of *Journal of Applied Ecology*, ecologists from the Netherlands and Eritrea say that over tapping the trees results in them producing fewer, less viable seeds.

Frankincense is an aromatic hardened wood resin obtained by tapping *Boswellia* trees. For thousands of years, frankincense has been hugely important both socially and economically as an ingredient in incense and perfumes. But, say the ecologists, its production in the Horn of Africa is declining because *Boswellia* woodlands are failing to regenerate.

The ecologists hypothesised that poor regeneration was due to the fact that intensive tapping meant that the trees were diverting too much carbohydrate into resin, at the expense of reproductive organs, such as flowers, fruit and seeds. Working in south-western Eritrea, they tested the hypothesis by looking at how many seeds intensively tapped trees produced, and their germination rates, compared with untapped trees.

According to one of the authors of the study, Professor Frans Bongers of Wageningen University: "This study strongly suggests that there is competition between investment of carbohydrates in sexual reproductive structures and synthesis of frankincense in *Boswellia papyrifera*. At all study sites, trees subject to experimental tapping produced fewer

flowers, fruits and seeds than trees that were exempt from tapping. Furthermore, tapped trees produced smaller fruits with seeds of lower weight and reduced vitality than non-tapped trees."

Based on their findings the authors say that, for production to be sustainable, the way that frankincense is tapped needs to be changed. "In order to control the decline in fruit and seed production, less intensive tapping procedures should be developed. As our results show that six tapping points per tree are already having a negative impact, we suggest reducing the number of tapping points. New tapping regimes should include rest periods when there is no resin harvesting to allow the trees to recover," they say.

Although the impact of tapping trees for other crops, such as latex and pine resin, has been studied in plantations, this is the first study to show quantitatively the fragile relationship between the extraction of wood exudates and tree regeneration in natural populations.

Source: Blackwell Publishing Ltd.

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