

## Ensuring the future of sandalwood oils

The sandalwood species of the South Pacific were heavily exploited for their essential oils in the 18th and 19th centuries but the situation today varies from place to place. In New Caledonia, *Santalum austrocaledonicum* is still cultivated on small areas. In French Polynesia, *Santalum insulare* is an endangered species. Despite its utilisation and its heritage aspect, very little is known about this species. CIRAD and its local partners have conducted research in molecular biology and ecology to define the rules for sustainable development and conservation of sandalwood species.

The results show that the ecology of the sandalwood tree is still poorly known. On some islands its diversity is low. Using molecular markers, researchers have defined the genetic links between populations and made hypotheses to track its colonisation routes. In New Caledonia, populations on the Loyalty Islands differ from those on Grande-Terre. The sandalwoods of French Polynesia seem to have come from the Hawaiian islands via the Cook Islands.

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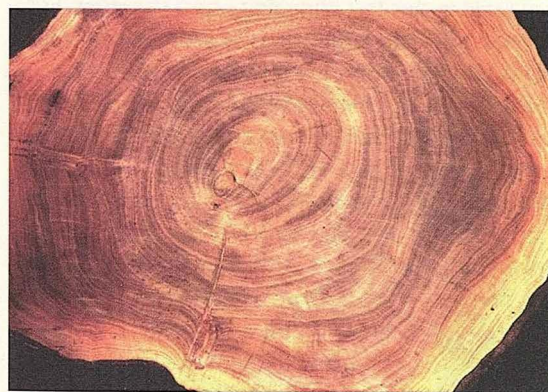


nature, communities &amp; biodiversity



Using quantitative markers the researchers verified the impact of environmental selection pressure (e.g. variations in fruit size depending on rainfall patterns). Analysis of the essential oils shows a complex distribution of the different molecules within and between populations; there are usually wide variations within populations.

With these first results, it was possible to suggest to the rural development and environmental management services some measures for improving sandalwood management. In New Caledonia, two areas of origin could be set up. In Polynesia, conservation strategy could consist of defining one area of origin per archipelago and restoring diversity in some populations. As regards processing, the differences in quality between New Caledonian populations suggest that it should be possible to rank the different origins, but research is needed to see whether such distinctions would be economically useful.



• Sandalwood has been much sought after for centuries – for its wood and for its essential oil, used in perfumes, cosmetics and for pharmaceuticals. The earliest known trade in sandalwood dates back to 300-400 BC. It was harvested in India, then in the Pacific. By the mid-19th century, the Pacific islands had been completely stripped and the golden age of Australian sandalwood began, lasting until the mid-20th century when trade volumes plummeted. Several species have become extinct, others are in danger of extinction and with some species, populations have shrunk so much that genetic diversity is affected.