

Fragrant Evolution: Phylogeny and Ethnobotany of Sandalwoods. (Oral Presentation)

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Introduction

Sandalwood, commonly known for its aromatic oil, is arguably one of the world's most culturally, economically, and scientifically valuable plants. The sandalwoods comprise the genus *Santalum* (Santalaceae), which includes approximately 15 extant species, 14 varieties, and 1 extinct species, ranging from India, Australia, Indonesia, the South Pacific, and the Bonin and Hawaiian islands.

Objectives

The main objective of this research is to reconstruct the phylogeny of *Santalum* in order to examine hypotheses concerning the evolutionary history of these plants. In addition to elucidating the relationships between sandalwood taxa, the phylogeny allows us to examine evolutionary patterns in the chemical components of the aromatic oil and traditional uses of the oil.

Methods

A phylogeny of the sandalwood genus was reconstructed using a combination of nuclear and chloroplast markers. By mapping the chemical components of each species on the phylogeny, we can examine trends in chemical composition through time and how evolutionary changes in chemical composition correlate with trends in medicinal and other ethnobotanical uses.

Results

There are not clear evolutionary trends in all major chemical components of sandalwood oil. For example, the most commercially valuable and aromatic species, *S. album* and *S. spicatum*, which contain the highest percentage of alpha- and beta-santalol, are not most closely related. However, the chemical composition of the oil does correlate with many traditional uses.

Conclusion

The sandalwood phylogeny elucidates the patterns of relatedness of *Santalum* taxa and historical dispersal patterns throughout the Pacific. Though there are not clear evolutionary trends in all of the major aromatic oil components, there are correlations between oil composition and traditional uses of the oil.

Keywords: *Santalum*, Pacific, biogeography, essential oil, chemistry, traditional uses

Selected References

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