

# FUNCTIONAL FUNGI: Are there consistent trends in water acquisition strategy under water stress?

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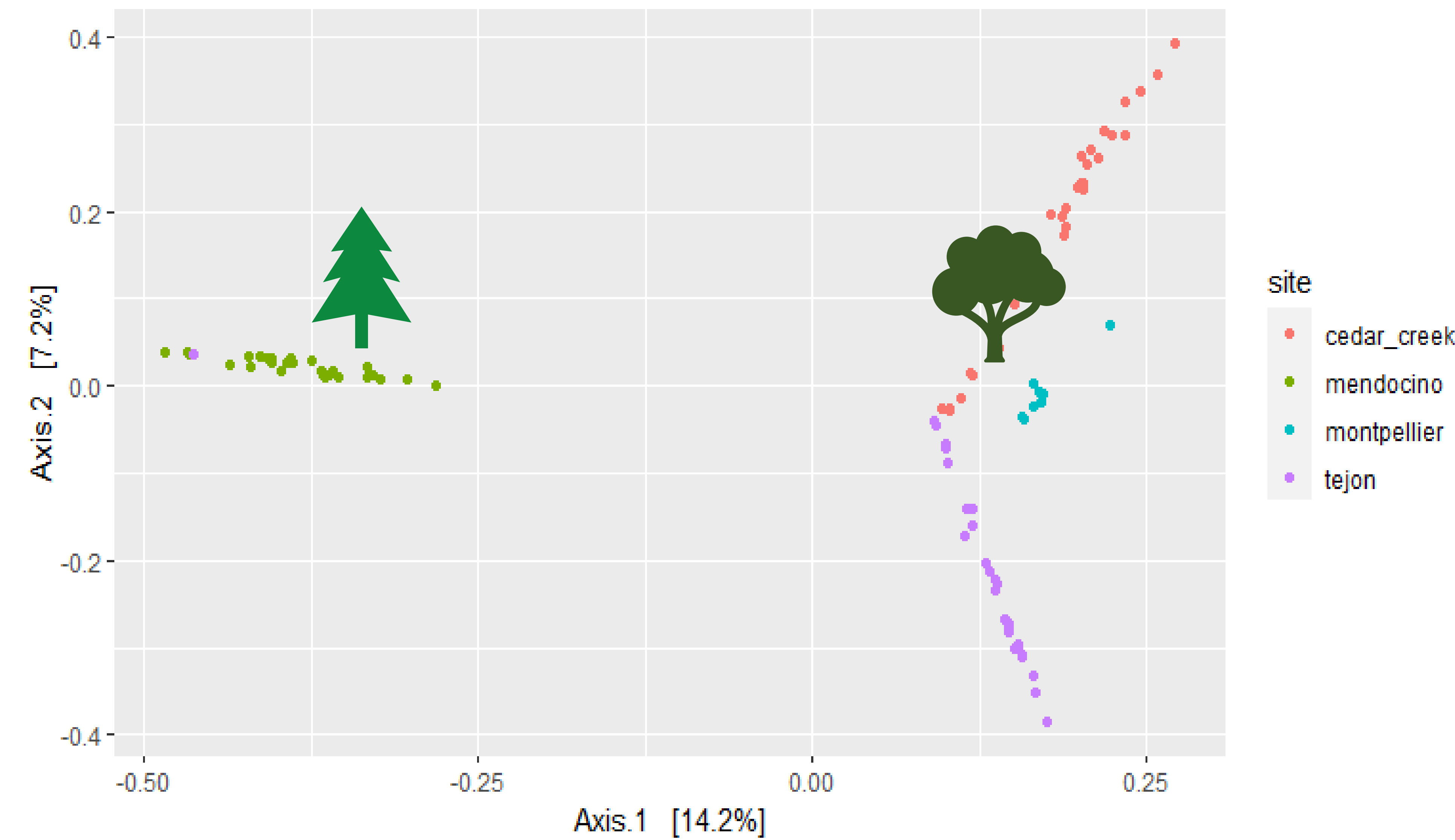
## SUMMARY

Ectomycorrhizae (EcM) are an ecologically valuable and taxonomically diverse group of fungi. This project pulls together data from four studies to explore if EcM communities share more drought tolerant traits in dry sites. These ordinations reveal potential trends in water acquisition strategy under drought stress in wild EcM communities. While community data is limited in its ability to yield information about study sites, functional trait meta-analysis has the potential to provide insight into the lived conditions of wild EcM communities as well as their potential resilience to drought conditions.

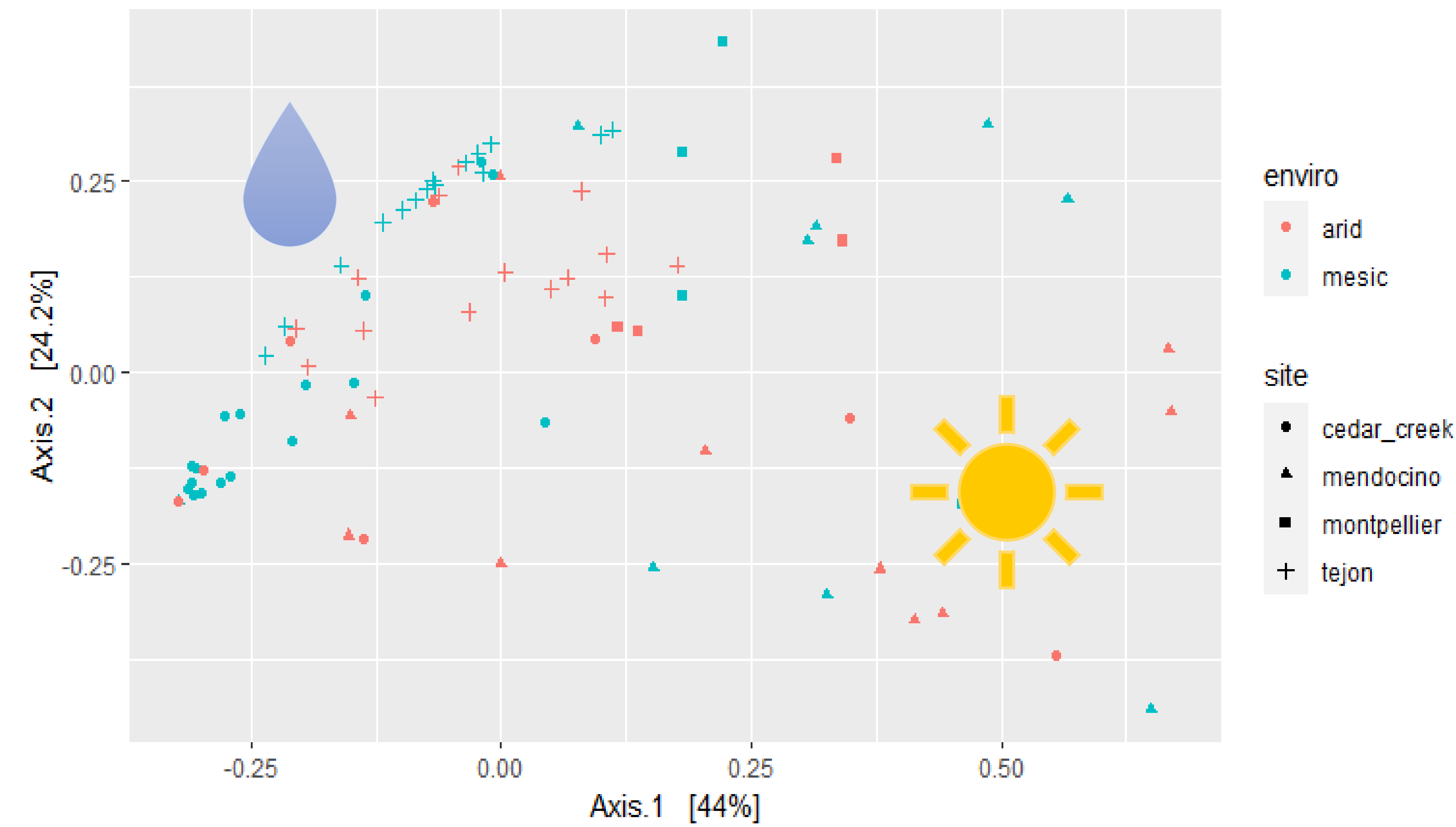
## METHODS

This study includes datasets from four studies. These studies a) compared trees in distinct “wet” vs “dry” groups, b) logged ectomycorrhizal community data through root tip sampling and DNA sequencing, c) grouped EcM communities by tree, and d) made accessible their datasets for our use. OTU abundance data was relativized. Taxa were derived and annotated by functional traits (exploration type and rhizomorph formation; or logged as unknown for one or both categories) using DEEMY and the Fun^fun database. The relative abundance of traits was calculated, and both the taxonomy frequencies and trait frequencies were ordinated using Principal Coordinates Analysis and the Bray-Curtis dissimilarity.

## Fungal Species



## Fungal Traits



## RESULTS

99 trees were analyzed (46 arid, 56 mesic), spanning numerous taxonomic groups (*Quercus*, *Salix*, *Pinus*). Ultimately, taxa appear to separate along variation by host phylogeny (gymnosperms vs angiosperms). It appears that mesic sites may have some relative similarities, and for some sites, it difference in environmental water availability can be revealed through comparative functional trait analysis. More work must be done to further untangle the parameters of these relationships.

## ACKNOWLEDGEMENTS

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Site	Study	Qualities
Tejon Ranch, S.CA	Bui et. al 2020	Oaks and Pines
Mendocino, N.CA	Moeller et. al 2014	Pines
Cedar Creek, MN	Erlandson et. al 2016	Willows
Montpellier, France	Richard et. al 2011	Oaks ( <i>Q. ilex</i> only)