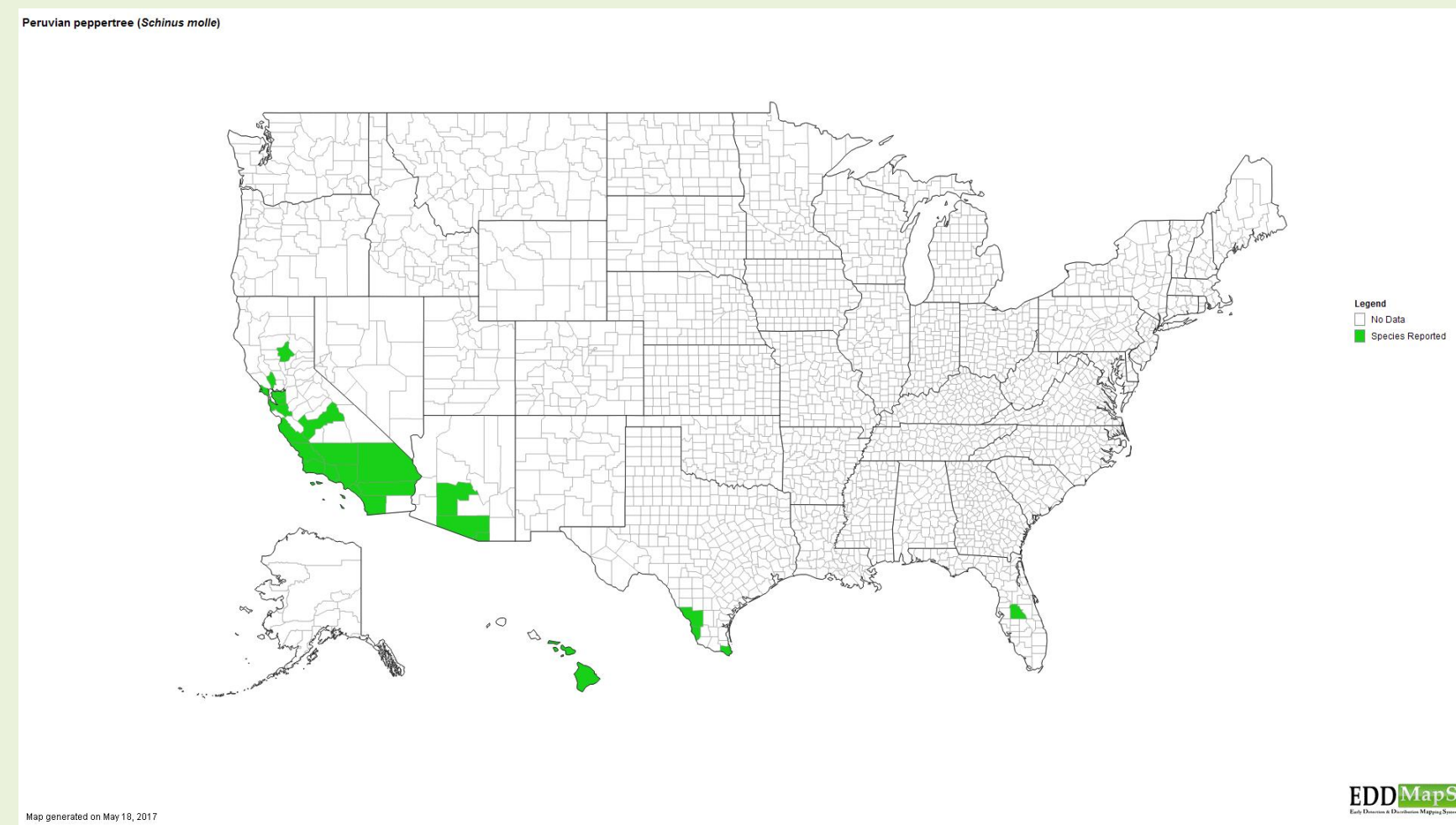


Allelopathic impacts of *Schinus molle* on invasive and native plant species of Southern California

Distribution



Pistillate



Staminate



Fruits & Flowers



Native Species Tested:

Amsinkia intermedia



Sierra Lauman

Phacelia distans



Sierra Lauman

Stipa pulchra



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Invasive Species Tested:



Sierra Lauman

Silybum marianum



Sierra Lauman

Bromus madrentensis



Sierra Lauman

Brassica nigra

Introduction:

- This study will be performed to assess the allelopathy from litter and potential soil legacy effect left by *Schinus molle* L. (Peruvian or California pepper tree; Anacardiaceae). Since it was introduced in 1840, its widespread use as an ornamental street tree in Southern California enabled its naturalization into native and invaded plant communities (Howard & Minnich, 1989; Nilsen & Muller, 1980a).
- In Northern Mexico, five out of six cactus species suffered lower germination rates and growth in soil collected beneath male pepper trees (Avendaño-González et al. 2016). In Southern Africa, aqueous extracts from the pepper tree inhibited weeds and wheat in manure amended soil (Materechera et al., 2008).
- Previous studies on the pepper tree have focused on female leaves and fruits, which are thought to have higher concentrations of terpenes (Anaya & Gómez-Pompa, 1971; Borella et al., 2011; Materechera et al., 2008; Pawlowski et al., 2012; Zahed et al., 2010).
- Future studies comparing mulches made from male leaves with staminate flowers against females fruits and leaves could elucidate potential pathways to make applications selective against weeds.

Method



Coconut Shells (Control Non-Allelopathic)



Male Leaves and Flowers



Female Leaves and Crushed Fruits

Mulch Experiment: To investigate the impacts of leaf litter from both genders, two mulch types from each gender were applied in 25 cm flats and seeded with 20 seeds from three native and three invasive species. Each species will have 5 replicates and will receive 60 grams of each mulch type and one control with no mulch.

Soil Legacy Experiment: Other species in the pepper tree genus, like *Schinus terebinthifolius* leave a soil legacy effect that alters soil microbes, stifling the recovery of native species in Florida even when removed. Soil from female trees and male *S. molle* trees will be put in 25 cm trays and sowed with the same species used in the mulch experiment. Each species will have 5 replicates and will have 3 liters of male, female, or control soil (25m from any pepper tree).

Predictions and Expected Results

I hypothesize that *S. molle* will be non-selective and will reduce the germination and dry biomass of all six species. I expect that soil under and mulch made from male plants will be more allelopathic than soil under and mulch made from female plants, as found in Avendaño-González et al. (2016). If native species can tolerate either female or male pepper trees and certain invasive species cannot, native plants could be planted near or beneath the canopy of pepper trees or in association with pepper tree mulch for restoration.

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