The Effect of Native Velvet Mesquite (Prosopis velutina) and Non-Native African Sumac (Rhus lancea) on Biodiversity in the Sonoran Desert

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The effect of native Velvet Mesquite (Prosopis velutina) and non-native African sumac (Rhus lancea) on biodiversity in the Sonoran Desert Cassidy Chamillard Tucson High Magnet School, Tucson, AZ Urban development has lead to discussion over human impact on the environment as native species are replaced by foreign ornamentals and ecological relationships are disturbed. Arthropod and plant samples were collected from native and non-native trees in urban Tucson and in the Coronado National Forest area, Sabino Canyon. These locations allowed for a comparison between developed and natural environments and for the impact of the native mesquites and non-native African sumacs to be observed in urbanized and undisturbed areas. It was hypothesized that native trees would have a higher abundance of both plant and insect diversity than non-natives, that Sabino Canyon would have a higher overall diversity than Tucson, and that soil beneath native trees would have higher nutrient values. Transects and traps were used to sample sixteen trees to quantify diversity of insects and plants. Nutrients were measured from soil using garden kits and seeds were grown in a greenhouse. By effect of location, plant diversity in Tucson was higher, Shannon Diversity (H)= 1.43, than in Sabino Canyon, (H)= 1.2, while insect diversity showed no significant difference. Comparing native to non-native trees, insect diversity was higher under native trees, (H)= 1.46, than non-natives, (H)= 0.88, while plant diversity showed no significant difference. Soil from Sabino Canyon had higher nutrient levels and seed germination success. Urbanization of the Sonoran Desert, thus, has a significant effect on plant, arthropod, and soil communities as ecosystems shift and non-native trees are introduced.

Awards Won:
University of Arizona: Tuition Scholarship Award