

## Unusual Robustness of a Novel *Boechera* of the Eastern Sierra

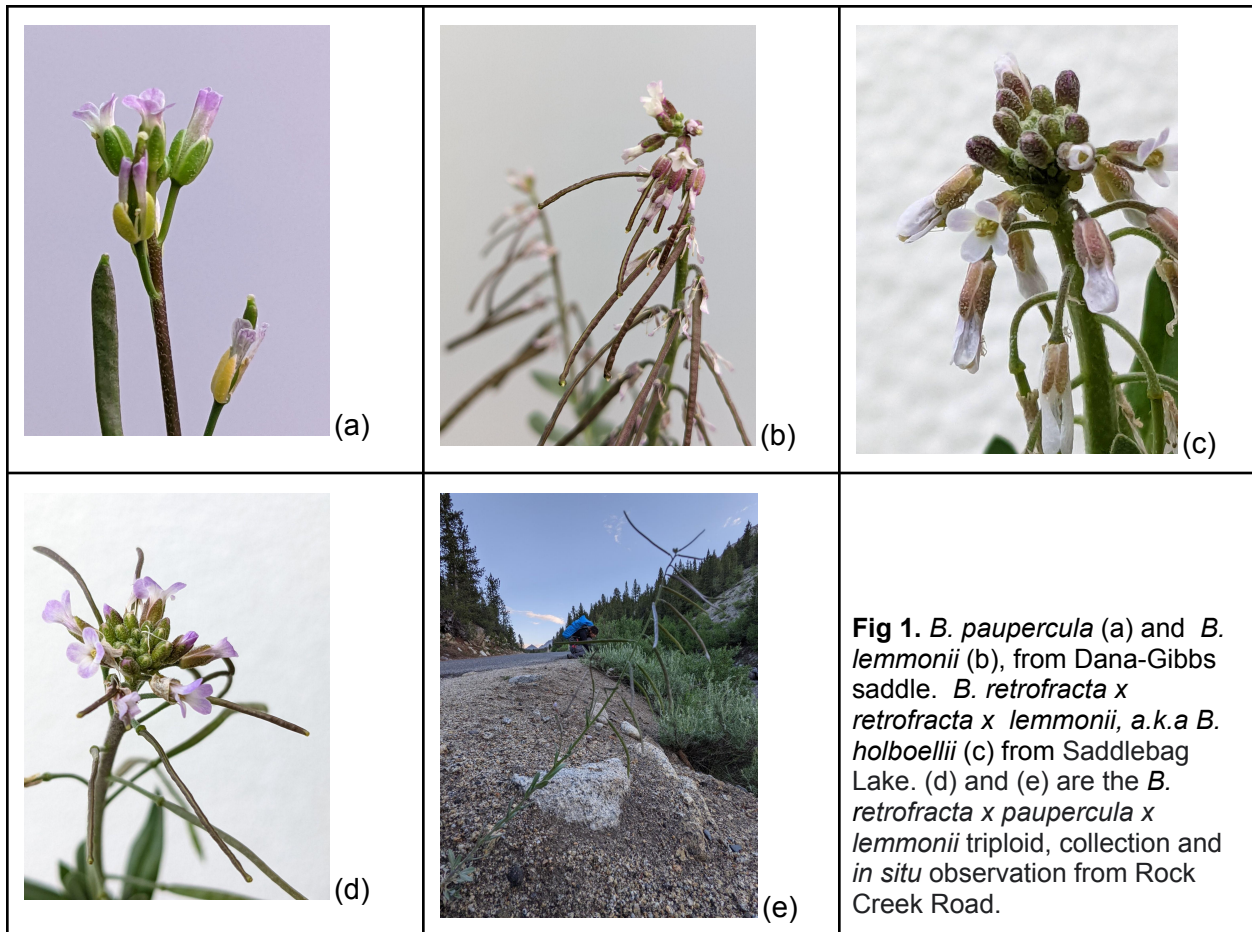
### 2022 Mary DeDecker Botanical Grant Progress Report

Tamsen Dunn - PhD student in Evolutionary Biology

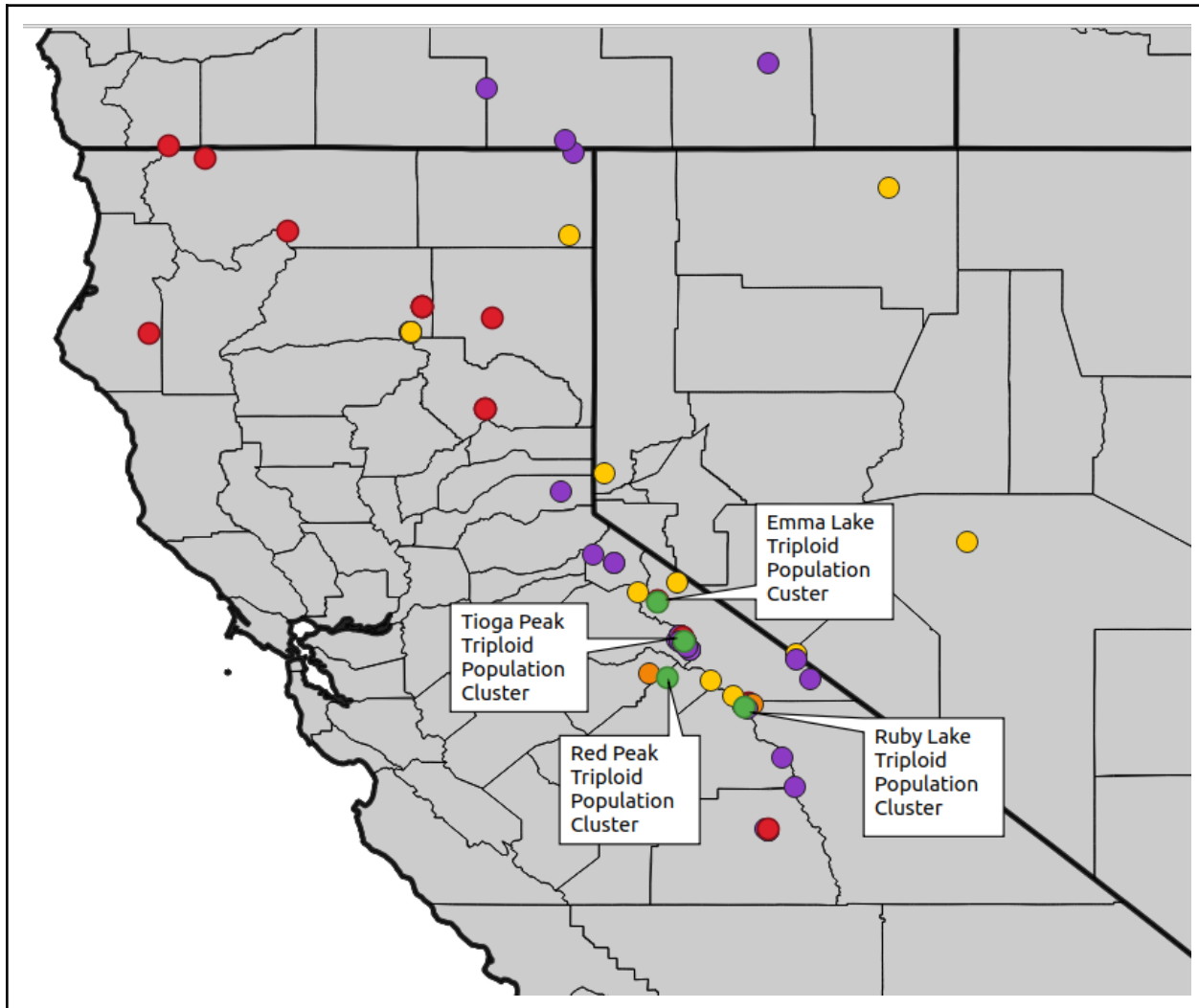
San Diego State University, 5500 Campanile Dr, San Diego, CA 92182

University of California at Riverside, 900 University Ave, Riverside, CA 92521

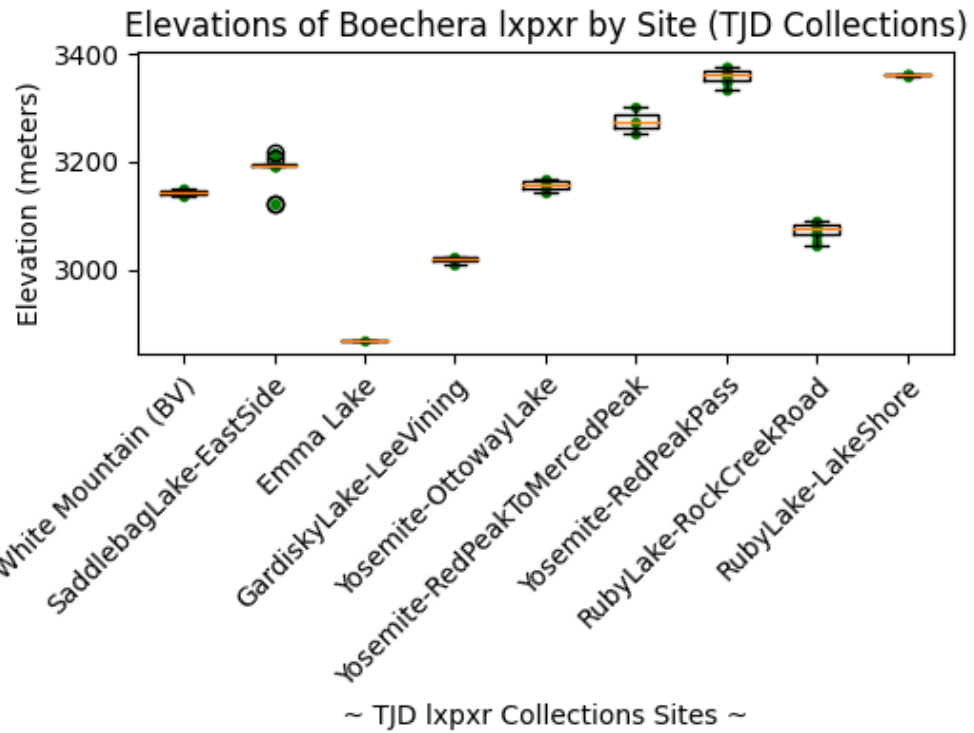
In 2004, an inconspicuous, intermediate-looking *Boechera* was collected high in the Clark range in southeastern Yosemite. This mountain plant conformed to no known species, but laboratory testing at SDSU revealed that the plant had unusual heat stress tolerance, surpassing even its desert-dwelling relations. Genetic testing suggested that the plant was a novel triploid hybrid of *B. retrofracta*, *B. paupercula*, and *B. lemmonii*. In my 2021 field work, I returned to the original Yosemite collection site as well as numerous sites throughout the Eastern Sierras in Mono and Inyo counties in search of more of these strange plants. In my 2022 field work, I returned to some previous sites (Rock Creek Road, Rubly Lake, and Mono Pass among them) but also expanded my collecting northward and eastward, to explore the range extent. Long-awaited genetic testing results finally came in fall of 2022, confirming what I had seen based on morphology – indeed the *B. lemmonii* x *retrofracta* x *paupercula* hybrid is thriving in large communities, and fairly widespread in the Eastern Central Sierras, as far north as the Sierra Junction and south as far as Bishop, typically at elevations between 3000 and 3400 meters. For the next year, I will be continuing my genetic assessment of the collections, expanding my field work, and performing a population analysis to elucidate the extent, origin and population dynamics of the (as yet unnamed) *retrofracta* x *paupercula* x *lemmonii* triploid. We hope to prepare a series of papers on our new species, the first of which we hope to see in press in 2023. I am so excited about this work, and I am incredibly grateful for the support of the Bristlecone CNPS!



**Fig 1.** *B. paupercula* (a) and *B. lemmonii* (b), from Dana-Gibbs saddle. *B. retrofracta* x *retrofracta* x *lemmonii*, a.k.a *B. holboellii* (c) from Saddlebag Lake. (d) and (e) are the *B. retrofracta* x *paupercula* x *lemmonii* triploid, collection and *in situ* observation from Rock Creek Road.



**Fig 2.** Map of population clusters where the *B. retrofracta x paupercula x lemmonii* triploid has been genetically confirmed. *B. retrofracta x paupercula x lemmonii* collection sites are green. Genetically confirmed parental species *B. paupercula* (purple), *B. lemmonii* (yellow), *B. retrofracta* (red), and *B. holboellii*, a.k.a. *B. lemmonii x retrofracta* (orange) are also shown.



**Fig 3.** Boxplots giving the elevations of my confirmed *B. retrofracta x paupercola x lemmonii* collections, by site. Collections were made in 2021 and 2022.