

January 2012

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Recommended Citation

Brevik, Taylor and McGlaughlin, Mitchell (2012) "Divergence of Sulfur-Flower Buckwheat using DNA Analyses," *Ursidae: The Undergraduate Research Journal at the University of Northern Colorado*: Vol. 2 : No. 1 , Article 11.

Available at: <http://digscholarship.unco.edu/urj/vol2/iss1/11>

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Divergence of Sulfur-Flower Buckwheat using DNA Analyses

Biological Sciences

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Eriogonum umbellatum Torr. (Polygonaceae), the sulfur-flower buckwheat, is among the most diverse plant species in North America with 40 different recognized varieties. Several of these recognized varieties are rare, 24 of which are termed vulnerable, imperiled, or critically imperiled by NatureServe (natureserve.org). *Eriogonum umbellatum* species can be found inhabiting 10 states and 2 Canadian provinces in the mountainous west. Varieties display broad morphological, ecological, and geographic differences which make each taxonomically distinct. For this study, I am analyzing and comparing nuclear (ITS) DNA, inherited from both parents, and chloroplast DNA, inherited maternally, among five different varieties of *Eriogonum umbellatum* from several distinct populations residing in both Colorado and Oregon. Tissue samples were collected from several individuals from each population. The five varieties of interest include *E. umbellatum* var. *hausknechtii*, *E. umbellatum* var. *modocensis*, *E. umbellatum* var. *majus*, *E. umbellatum* var. *aureum*, and *E. umbellatum* var. *umbellatum*. Genetic analyses of these varieties using molecular markers should help to evaluate gene flow between populations and among varieties, mechanisms of differentiation, and evolutionary history. Understanding these will allow us to determine whether these varieties are monophyletic, share a common ancestor, or if they should be considered distinct evolutionary entities. Implications of this research could affect land management and conservation efforts, as well as our understanding of the mechanisms of evolutionary differentiation within diverse plant taxa.