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Life History of *Phrydiuchus tau* Associated with Mediterranean Sage in Idaho, USA

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Mediterranean sage, *Salvia aethiopis* L. (Lamiaceae), is a biennial weed infesting an estimated 600,000 ha of western North American rangeland. In northern Idaho, Mediterranean sage infests roughly 1,500 ha of steep, mostly overgrazed rangeland in river canyons. Two root-feeding weevils, *Phrydiuchus tau* Warner and *P. spilmani* Warner (Coleoptera: Curculionidae), were introduced into the United States in 1974 as potential biological control agents. *Phrydiuchus tau* was later released in Idaho in 1979. This study represents the first detailed examination of this system in North America. Adult weevils emerge in spring and feed on the leaves of rapidly growing plants, but plants appear to suffer little from this feeding. One-year-old plants bolt and flower in June and then die. Drought and plant senescence induce *P. tau* to aestivate from June to October. With the onset of fall rains and cooler temperatures, weevils emerge to feed and mate. Oviposition occurs during the fall, during warm winter periods, and during the following spring. Eggs, larvae and adults overwinter. Eggs are laid externally on leaves and leaf petioles and in leaf axils. An average of 3.5 eggs/plant (range: 0-30 eggs) are deposited during the peak oviposition period. Larvae burrow through leaf petioles and into the root crown, feeding on surrounding tissue. Plants are severely impacted by larval feeding, but many plants can compensate for this damage and continue growth. This effect may delay flowering one or more years. At 2 sites, approximately 80% of plants were previously attacked. Larvae pupate in soil cells near the host plant in May. The impact of larval feeding varied significantly across the sites studied. Mediterranean sage population densities vary greatly and local extinctions are common. It appears that *P. tau* may affect Mediterranean sage more significantly than was previously assumed. The focus of our current research is to elucidate the biotic and abiotic factors that regulate the population dynamics of Mediterranean sage.