# MULTITROPHIC INTERACTIONS IN THE *BACCHARIS DRACUNCULIFOLIA* SYSTEM

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*Baccharis dracunculifolia* D. C. (Asteraceae) is a shrub widely distributed across South America. It hosts a speciose fauna of insect herbivores and the largest fauna of galling insects in the Neotropics (15 species). As a result, the *B. dracunculifolia* system has been extensively used as a study model in ecological research and several interactions involving the host plant and the associated entomofauna have been empirically demonstrated in the system. Based on a literature review we built an indirect interactions web encompassing 11 direct and nine indirect interactions across multiple trophic levels. We also performed additional manipulations in the system to investigate the rule of direct and indirect effects on web structure and stability. In a field experiment we greatly reduced the abundance of the commonest gall found on *B. dracunculifolia,* induced by the psyllidae *Baccharopelma dracunculifoliae,* and constructed quantitative galler-parasitoid webs for manipulated and control plots. Despite there being no shared parasitoids among galler species, the manipulated webs showed lower complexity and stability. It is likely that the effects of the manipulation spread via trophic links not included in the web or non-trophically. Thus, in another experiment, we explored how a non-trophic indirect effect could propagate through the system. The hatched galls of *B. dracunculifoliae* dry out and remain attached to the plant. Both hatched and non-hatched galls of *B. dracunculifoliae* are occupied by many inquiline arthropods, including the aphid *U. erigeronensis*, which can negatively affect galling larvae. We hypothesized that this galler's "extended phenotype" could have a negative effect on the galler by virtually increasing the abundance of galls and therefore attracting more parasitoids to attack them, or, in contrast, it could have a positive effect on the galling insect by helping to alleviate the pressure of inquilines on live galls. Thus, we excluded hatched galls from clusters of the plant species and added them to other clusters to test the effect of hatched galls on the galler as well as on parasitoids and aphids. The manipulation affected aphid density, although not in a clear-cut way, and lowered parasitism rates on the galling insect. It also affected the way that aphid density and parasitism rate varies with gall abundance (density-dependence). The addition of hatched galls on plants resulted in lower parasitism rate on the galling species and eliminated density-dependence in clusters with low to intermediate gall abundances. In addition, parasitism rate was negatively correlated with aphid density. Further investigation is required to elucidate the mechanism whereby the indirect effects involving hatched galls, aphid density, and perhaps ants tending aphids, seem to combine to modulate the interaction between the galler and parasitoids in a multitrophic web of direct and indirect interactions. These results illustrate that the structure and dynamics of ecological communities cannot be fully understood without considering both trophic and non-trophic direct and indirect interactions across multiple trophic levels.