

Hemiparasitic plants are photosynthetic angiosperms that draw water and mineral nutrients from the roots of other plants. They also have some capability to exploit soil water and nutrients. Thus, they are parasitic exploiters of their hosts and potential competitors for soil nutrients and light with their hosts. They have some characteristics of intraguild parasites but the relationship to their hosts is more complicated because they share multiple resources with their hosts. Enemies like parasites and predators can enhance the diversity of a community when they exploit competing victims and have more detrimental impacts on superior competitors than on inferior competitors, an effect known as keystone predation or parasitism. We developed a differential equation model of a hemiparasite exploiting two competing hosts and asked these questions: 1) can the hemiparasite act as a keystone enemy, and is that effect dependent on environmental productivity? 2) how does the effect of competition for light change the potential for keystone effects of the exploiter? 3) how does the effect of the hemiparasite as an intraguild parasite alter its potential as a keystone exploiter? Models suggest that keystone hemiparasitism is likely at intermediate levels of productivity. Competition with hosts for both light and soil resources expands the environments in which a hemiparasite can be a keystone enemy, when compared to a simple parasite. These results suggest that hemiparasites may be important enhancers of diversity in plant communities, and may be important components of efforts to restore some natural communities, such as prairies.