

Pheromone and host odor attractants for managing *Diorhabda* spp.: biological control agents of saltcedar.

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Abstract

The recent identification of the aggregation pheromone^a and host odor attractant^b for the leaf beetle *Diorhabda elongata*, a biological control agent of saltcedar, allowed for a more detailed study of the chemical ecology of this beetle. Field results have shown that male and female *D. elongata* are clearly attracted to the two component pheromone. Additional lab studies have shown that the different *Diorhabda* strains, adapted for release at variable US latitudes, have identical pheromone compositions, but differ in component ratios.

The host odor attractant mimics the release of some antennally active green leaf volatiles that are emitted by saltcedar while being fed upon by adults and larvae. The green leaf compounds currently used in the host odor baits are present in emissions from all *Tamarix* species that are targeted for biological control and these baits are highly attractive to the beetles throughout the season. Furthermore, trapping data showed that combining the pheromone and host odor baits attracted even higher numbers of beetles and this combination showed a strong synergistic effect.

The attractants can be useful tools in the overall biological control program of saltcedar. The attractive baits have been successfully used in monitoring the presence of newly released beetles, in areas such as Lovelock, NV, and Moab, UT. Beetles dispersal from well established populations can be easily followed by baited traps, even in areas with no visual proof of any beetle presence. Also, retaining newly released beetles at the sites of release with the use of both pheromone and host odor has shown promising results, and this technique might be helpful in increasing the success rates of population establishment.

Lab and field work has demonstrated differences in biological activity of the single constituents that make up a behaviorally attractive blend, and these results are aiding our aspirations in trying to understanding the complex chemical beetle-plant interactions and mechanisms of beetle colonization of uninfested saltcedar.

^aCossé et al. 2005. J. Chem. Ecol. 26:1735-1748.

^bCossé et al. 2006. J. Chem. Ecol. in press.