

Examination of sex attractants for monitoring weed biological control agents in Hawaii

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Abstract

The identification of sex attractants was undertaken for potential use in the study of two biological control agents against *Rubus* spp. in Hawaii. Attractants for *Croesia zimmermani* (Lepidoptera: Tortricidae) and *Schreckensteiniella festaliella* (Lepidoptera: Heliodinidae) were developed by field screening a variety of putative lures in sticky traps, based on attractants for congeneric species. *Croesia zimmermani* was most attracted to *E*11-tetradecen-1-ol and *E*11-tetradecenal, while *S. festaliella* was attracted to (10,12)-(*E,E*)-hexadecadienal alone. Development of monitoring systems based on sex attractants can enable better evaluation of biocontrol programmes, and provide cost-effective information on presence/absence, density, phenology, synchrony with the host, dispersal rate and other useful parameters.

Keywords: Sex attractant, Hawaii, weed, monitoring, Tortricidae, Heliodinidae

Introduction

Inadequate monitoring of agents following their release has long been recognized as a critical failing of biological control programs. In the face of recent challenges to the ecological safety of biological control (Simberloff & Stiling 1996), the need to document impacts on target and non-targets is now greater than ever (Delfosse 1999). Unfortunately, monitoring insects released for biological control of weeds often relies on sampling from plant material (e.g. Nagata & Markin 1986). This method is labor-intensive and insufficiently sensitive when insect populations are at low density or cryptic. By contrast, a method widely used for pest management in agriculture and horticulture involves sampling adult insects using sticky traps baited with pheromones or other attractants. Advantages of pheromone trapping in biological control programmes include low costs for materials and labour, ability to survey extensively in time and space, efficacy at low population density, high specificity for the target species, and high correlation with reproduction since adults are sampled (Suckling et al. 1999, 2000). In addition to the use of attractants to support post release monitoring and efficacy studies (Suckling et al. 1999), such systems can also give

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