**Section I:** Invasive Pests, Emerging Pests, and Hot Topics of Interest

# DEVELOPMENT OF A HIGH THROUGHPUT LABORATORY BIOASSAY FOR DETECTING SLUG AND SNAIL ATTRACTION TO ODORS AND IDENTIFICATION OF A HIGHLY ATTRACTIVE FOOD SOURCE

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Terrestrial gastropods cause economic damage to crops in a number of ways, including reducing yield due to consumption of seeds, seedlings, roots and aerial parts of mature plants, and decreased crop quality due to the presence of mucus and faeces (Barker, 2002). Current control strategies are focused almost exclusively on chemical molluscicides, which are ineffective under certain conditions, and which can have serious non-target effects (Studdert, 1985). There is therefore an ongoing need to develop alternative management options. One such option is the development of novel attractants for use in traps and in attract-and-kill strategies. However, in contrast to insects, very little work has been done to explore the chemical ecology of gastropod species, especially with regard to exploiting the chemical cues that they use to find host plants or the chemical signals that they use for intraspecific communication (e.g., reproductive interactions). What little work has been done has been relatively superficial, for example, comparing attraction to various food sources, with little or no follow-up work to identify the attractive odors. However, even these preliminary studies have clearly shown that chemical cues and signals play a major role in a wide range of gastropod behaviors. These include feeding, homing, avoidance of predators, and a variety of social and reproductive behaviors (Croll, 2008).

The initial goal of this study was to develop a generic high-throughput bioassay method that can be used in identifying novel attractants for any pest gastropod species by screening a wide variety of foodstuffs and other possible attractant sources. We used the European brown garden snail, *Cantareus aspersus*, and the gray field slug, *Deroceras reticulatum*, as our initial target species because they are known pests, and there is evidence of attraction of each species to specific plants (Baker *et al*., 2012; Pickett and Stephenson, 1980).

Our data suggest that from the previously reported attractants and additional odor sources that we tested in choice and no-choice bioassays, chopped cucumber was consistently the most attractive to our target species. Interestingly, previous experience with a particular food appeared to influence subsequent food choice for both *C*. *aspersus* and *D*. *reticulatum*, but this conditioning was not absolute and could be broken. Our future research will involve using our high-throughput method for bioassay-guided fractionation of active extracts of cucumber, with the goal of identifying individual compounds or blends of attractive compounds for field testing.

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**References**

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