SIMILARITIES AND DIFFERENCES IN PHEROMONAL AND HOST-PLANT RELATED CHEMICAL COMMUNICATION OF FLEA BEETS *PHYLLOSTRETA CRUCIFERAE* GOEZE AND *PH. VITTLA* REDTENBACHER (COLEOPTERA, CHRYSOELIDAE)

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*Phyllotreta cruciferae* Photo

Introduction

Flea beetles (*Phyllotreta cruciferae*) are important pests of many cruciferous crops, causing damage by feeding on seedlings in early spring, and in turn transmitting various plant pathogens [1-4]. Both *Phyllotreta cruciferae* Goeze and *Ph. vitulla* Redtenbacher rank among the most important flea beetles in Europe [5]. We set out to study their pheromonal and host-related chemical communications because knowledge gained in these areas may form the basis of the development of new tools and methods useful in their control.

**MATERIALS AND METHODS**

Field tests were conducted at sites in Hungary, as described previously [5]. The samples of *Ph. vitulla* and *Ph. cruciferae* were obtained from Pusztazámor, Pest county, Hungary. Insects were collected by manual beating on plants and placed in vials with a moist cotton ball. When insects were obtained in sufficient numbers, the vials were stored at a temperature of 5°C.

To analyze the behavior of insects in response to extracts, the insects were placed in 50 ml (15 insects) glass vials. The insects were anesthetized by exposing them to a cold room (5°C) for 1 hour prior to insertion into the vials. The insects were then tested for their response to the extracts by exposing them to various test substances at room temperature for 30 min. Thereafter, the insects were observed for 30 min for behavioral changes.

In the first test, we tested the behavior of insects in response to the extracts of different plants. The extracts were prepared by homogenizing the plant material and centrifuging at 3000 rpm for 10 min. The extracts were then stored at 5°C. The extracts were tested for their ability to elicit behavioral responses in the insects.

The results of the behavioral tests showed that the insects had a strong response to extracts of the plant species tested. In general, the insects were more active in response to extracts of plants that contained the compounds of interest. However, there were some differences in the responses of the insects to the different plant extracts. For example, the insects were more active in response to extracts of *Ph. vitulla* than to extracts of *Ph. cruciferae*.

**RESULTS AND DISCUSSION**

We found remarkable similarities in the pheromonal communication of the two species. Recently, male synthetic compounds have been identified in the European population of *Ph. cruciferae* [6] and the benzenoid compounds comp. A-C,D,E,H [11]. In addition, the bitter compounds (in percentages of volatile compounds) were similar in all treatments were similar in all treatments.

In both species the major component was comp. A. The other components were: Ph. cruciferae comp. B, Ph. vitulla comp. B. In all tests the component comp. A was the most abundant in all treatments.

In the second test, we tested the behavior of insects in response to the extracts of different synthetic compounds. The synthetic compounds were prepared by mixing the pheromonal components at various concentrations. The compounds were tested for their ability to elicit behavioral responses in the insects.

The results of the behavioral tests showed that the insects had a strong response to the synthetic compounds. In general, the insects were more active in response to the synthetic compounds that contained the compounds of interest. However, there were some differences in the responses of the insects to the different synthetic compounds. For example, the insects were more active in response to the synthetic compound comp. A than to the synthetic compound comp. B.

**CONCLUSIONS**

The present study demonstrated that the pheromonal communication of the two species is very similar. It is shown that the compounds of interest are involved in the pheromonal communication of both species. The synthetic compounds showed a similar effect as the natural compounds.

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**REFERENCES**