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PRIMING APHYTIS: BEHAVIORAL MODIFICATION OF HOST SELECTION BY EXPOSURE TO A SYNTHETIC CONTACT KAIROMONE

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The introduced parasitic wasp, *Aphytis melinus* DeBach (Hymenoptera: Aphelinidae), utilizes a kairomone, *O*-caffeoyltyrosine (*OCT*), to recognize California red scale, *Aonidiella aurantii* (Maskell) (Homoptera: Diaspididae). Wasps used in augmentative release programs for California red scale on California citrus are reared on oleander scale, *Aspidiotus nerii* Bouché (Homoptera: Diaspididae), themselves reared on squash. The goals of this study were: 1) to determine if long-term rearing on oleander scale caused *A. melinus* to develop a preference for oleander scale, 2) to determine if the preference of oleander-reared *A. melinus* for California red scale might be enhanced by exposing them to synthetic *OCT* in the laboratory, and, if so, 3) to determine if oleander-reared but *OCT*-primed wasps parasitized a greater proportion of California red scale in the field than unconditioned wasps.

Wasps that emerged as adults isolated from their hosts retained a strong preference for California red scale regardless of rearing host. This preference was reduced if wasps were allowed to emerge from oleander scale, thus acquiring early adult experience with oleander scale. The preference for California red scale was restored, however, by exposing wasps reared on oleander scale to synthetic *OCT*.

Preliminary field results suggest that wasps primed to *OCT* parasitize more California red scale than control wasps. Exposure of *A. melinus* reared in commercial insectaries to *OCT* prior to release may be a means to improve the effectiveness of augmentative release programs to control California red scale.

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Response of *Chrysopa septempunctata* to pheromones of aphidsK.S. Boo, I.B. Chung¹, L.J. Wadhams, J.A. Pickett²
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Sex pheromone, (4a*S*,7*S*,7a*R*)-nepetalactone and (1*R*,4a*S*,7*S*,7a*R*)-nepetalactol, and alarm pheromone, (E)- β -farnesene, of aphids were tested for their effects on *Chrysopa septempunctata*, one of the principal predators of aphids. In EAG tests, both of sex pheromone components showed a responsiveness but alarm pheromone gave no difference from that of solvents. Sex pheromone components also showed an attractiveness in a Y-tube olfactometer and field trappings with a higher attractiveness of (4a*S*,7*S*,7a*R*)-nepetalactone but alarm pheromone showed no evidence for attraction in both of laboratory bioassay and field trapping. Interestingly, spring and summer populations of *C. septempunctata* gave no response to sex pheromone components either.

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PREDATORY MITES CEASE TO RESPOND TO PLANT VOLATILES: A CONTAGIOUS PHENOMENON

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During foraging for spider-mite prey, the predatory mite *Phytoseiulus persimilis* is highly attracted to plant volatiles that are produced in response to spider-mite feeding. This phenomenon has been recorded consistently for several predator populations during more than 10 years. During a recent 5-year monitoring period, we have recorded for two of these populations that the predators lost their attraction to prey-infested plants.

The inability to respond to plant volatiles is accompanied by several other phenomena such as: high crystal load in the Malpighian tubules, reduced reproduction, reduced size, increased mortality.

The cause of this syndrome appears to be a non-genetical change in the predators that is contagious. When a predator from a 'normal' population is brought together with an individual from a non-responding population, the phenomena of the latter predator can be found in the 'normal' predator within a few days.

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MEDIATION OF HOST LOCATION BY VOLATILES IN THE GRAIN WEEVIL PARASITOID *LARIOPHAGUS DISTINGUENDUS* (FÖRST.) (HYMENOPTERA: PTEROMALIDAE)

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The role of volatiles for host location in parasitoids was examined in a tritrophic system, consisting of *Lariophagus distinguendus* (Först.), a parasitoid of different stored product beetles, the grain weevil *Sitophilus granarius* (L.), a worldwide pest which develops in kernels of stored grain, and kernels of wheat (*Triticum sp.*).

The experiments were performed in a four chamber olfactometer, at first using female parasitoids with oviposition experience. The parasitoids were attracted by volatiles emanating from uninfested and infested wheat kernels. They were able to differentiate between infested and uninfested kernels with infested kernels being more attractive. The potential volatile sources of an infested wheat kernel are weevil larvae, their frass and the damaged kernel. From these, the frass turned out to be most attractive to the parasitoids followed by infested kernels from which the larvae and the frass had been removed. These kernels were as attractive as uninfested, but cutted kernels. This indicates that their attractivity could be due to the mechanical damage of the kernels by the feeding weevil larvae. The larvae had no significant attractive effect. Experiments with inexperienced female parasitoids which were kept isolated from uninfested and infested grain upon emergence, indicate an increase of the responses to frass, mechanically damaged kernels and uninfested kernels due to experience.

Thus *L. distinguendus* uses volatile cues from both trophic levels, host (frass) and host plant (grain and damaged grain) for host location and modulates the response to these cues by experience.