STIMULI INFLUENCING HOST-FINDING BEHAVIOUR OF APPLE LEAFCURLING MIDGE (*DASINEURA MALI*) FEMALES

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Stimuli influencing host-finding behaviour of mated female apple leafcurling midge (ALCM) were investigated by presenting females with various combinations of plant chemical and visual stimuli in a wind tunnel. First, females were presented with apple or pear foliage. Relative to pear foliage, apple foliage stimulated more females to fly upwind and to approach and land on foliage. When pear and apple foliage were placed behind a screen in the wind tunnel to minimise differences in visual cues, female ALCM continued to be more responsive to apple foliage. These results indicated that volatile chemicals from apple foliage play an important role in the host-finding behaviour of apple leafcurling midge. In subsequent tests, we determined that volatile chemicals from immature apple foliage are more stimulatory to ALCM females than are volatiles from mature apple foliage and that these volatiles can be extracted by dipping foliage in dichloromethane for 50 seconds. Visual stimuli from foliage did not appear to play an important role in host-finding behaviour: the addition of visual foliar models to an airstream containing apple odours did not increase numbers of ALCM females taking off flying upwind, approaching, or landing.

STIMULI INFLUENCING THE MOVEMENT AND SETTLING OF NEWLY ECLOSED *EPIPHYAS POSTVITTANA* LARVAE

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In generalist herbivores, the newly eclosed larva, as well as the ovipositing female, often plays an important role in the selection of plant hosts. Little is known about the stimuli, both external and internal to the larva, that influence such host selection. We are studying the behaviour of newly eclosed larvae of *Epiphyas postvittana*, a generalist pest of New Zealand fruit crops, to determine what plant stimuli influence movement away from egg masses and settling on plants. In the absence of plant chemical stimuli, *E. postvittana* larvae walked towards objects that reflect or transmit wavelengths in the region of 470-570 nm (green) and were inhibited by objects reflecting 400-500 nm (blue) light. Visual stimuli also influenced spinning down on a silken thread by larvae: when surfaces below larvae reflected blue light, larvae were less likely to spin down than when surfaces were green or brown. In addition to visual stimuli from plants, larvae were influenced by chemical stimuli associated with epicuticular waxes of foliage. Such chemical stimuli were extracted by dipping apple foliage in dichloromethane for 50 seconds. Larvae walking on surfaces treated with such plant extracts stopped and bit surfaces more frequently and stopped for longer periods of time. Deprivation of food also slowed the movement of larvae by increasing the frequency of stopping and biting.