

Abstract

The objective of this work was to investigate whether or not olfactory clues play a role in host plant location by the polyphagous moth, *Helicoverpa armigera*. Volatiles collected from flowers of African marigold, *Tagetes erecta*, and sweet pea, *Lathyrus odouratus*, were found to elicit electroantennographic (EAG) responses from the antennae of female *H. armigera*. Compounds active in GC-EAG analyses of *T. erecta* floral headspace samples, identified by GC-MS and comparison of retention times on polar and non-polar GC columns with authentic standards, were (*E*)-myroxide, benzaldehyde, (±)-linalool, phenylacetaldehyde and (-)-piperitone. EAG-active compounds in *L. odouratus* floral headspace samples were identified as diacetone, (-)-linalool, phenylacetaldehyde and benzyl alcohol. Increases in upwind flight to air entrained extracts of floral odours indicated that these cues caused attraction when presented to female *H. armigera*. A synthetic *T. erecta* blend comprising benzaldehyde, (±)-linalool, phenylacetaldehyde and (+)-limonene gave significant increases in upwind flight approaches. Limonene (either (+)- or (-)-) was found to be important for the behavioural response despite having low EAG-activity. There was no significant difference in upwind flight response to odours from the live flower and the synthetic floral blend. Significant increases in upwind flight were also obtained when insects were presented with a synthetic *L. odouratus* blend which contained the four EAG-active compounds identified from GC-EAG studies. In field trapping experiments in Israel there was a significant difference in *H. armigera* catches in traps with a standard 4-component *T. erecta* lure compared with unbaited traps over the whole season. Mean *H. armigera* catch per trap per night (both sexes) over the whole season in unbaited traps, floral odour traps, pheromone traps and light traps were 0.004, 0.11, 8.8 and 1.35 respectively. The floral baited traps were non-selective catching large numbers of Hymenoptera and Diptera as well as other moth species. Field trapping experiments in Pakistan indicated that the floral lure was significantly attractive to *Earias* spp. and other Lepidoptera although very few *H. armigera* were caught due to low population density. Olfactory cues are discussed in relation to host-plant finding behaviour of *H. armigera*. They are involved in early stages of host seeking behaviour prior to alighting on the plant and stimulate searching behaviour.