Introduction

Many thrips species can be found in flowers, feeding and even breeding, but the precise methods that thrips use to find such flowers are not clear. The objective of this work was to elucidate some of the mechanisms by which thrips adults orientate towards flowers.

Materials & Methods

Western flower thrips were reared on potted flowering chrysanthemum plants, Dendranthema grandiflora cv ‘Sunny Cassa’ in a greenhouse at 25°C, 70% RH and a photoperiod of L16:D8. A field collected strain of Thrips tabaci was reared on leek using the bean-pod method, modified from Loomans and Murai (1997), at 25 ± 1°C and 65 ± 5% RH with a photoperiod of L16:D8 in a climate chamber. Adult females were collected from the rearing with an aspirator and starved overnight, only provided with water (Koschier et al., 2000) before they were used in experiments in an olfactometer or windtunnel.

The Y-tube olfactometer is described in detail by Koschier et al (2000). The windtunnel set-up is described by Smits et al. (2000).

Results & Discussion

Responses to individual odour compounds

The olfactometer experiments showed that several plant odour compounds were attractive for adult female western flower thrips. These compounds included benzenoids (benzaldehyde, p- and o- anisaldehyde), monoterpenes (geraniol, nerol, linalool, (+)-citronellol), sesquiterpenes and some other compounds (Koschier et al., 2000). Salicylaldehyde elicited negative responses and appeared to be repellent for western flower thrips at certain concentrations.

Responses of Thrips tabaci to some of the odours tested appeared to be quite different. Anisaldehyde which is attractive for western flower thrips, was not attractive for T. tabaci. Salicylaldehyde at a concentration that was repellent to western flower thrips appeared to be attractive for T. tabaci (Figure 1). This shows that different thrips species respond differently to odours.

Responses to flower oils and whole flowers

The flower-oils, Geranium oil and Rose oil, elicited no positive response from western flower thrips when used as an odour source.
in the olfactometer (Koschier et al., 2000). A single chrysanthemum flower (fully opened, half-opened or closed bud) used as an odour source in the olfactometer did not elicit positive responses from this thrips either. Interestingly, Gaum et al. (1994) found that the odour of several rose cultivars was either neutral or repellant to western flower thrips in olfactometer experiments. Apparently, the “complete odour” of the flowers of these thrips host plants was not attractive in the olfactometer set-up.

When western flower thrips females were offered a choice in the wind tunnel set-up between fully opened yellow chrysanthemum flowers, half open flowers or closed buds the majority preferred to settle on the fully opened flowers. When the flowers were covered with a perforated paper hood that allowed air to pass through but blocked sight, there was no preference for fully opened flowers (Smits et al., 2000; figure 2). This suggests that colour and not odour is the dominant factor determining thrips orientation towards flowers.

References