

Development and Application of Attractants and Controlled-release Microcapsules for the Control of an Important Economic Pest: Flower Thrips, *Frankliniella intonsa*

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Flower thrips, *Frankliniella intonsa* (Trybom) (Thysanoptera: Thripidae), are worldwide pests that cause damage to a range of plants in agriculture, horticulture and forestry and are vectors of several important plant viruses. The excessive use of chemical pesticides for flower thrips control can cause environmental and health problems. Therefore, the development of safe and effective lure control technologies and products is of great significance to reduce pesticide pollution, protect human health, and protect the ecological environment. To understand the olfactory organs of thrips, observation using a scanning electron microscope demonstrated that the antennae of flower thrips are bead-like, had eight segments, and are comprised of many types of antennal sensilla. By combining the electroantennogram and olfactometer, the components of the attractants of flower thrips were screened out and identified to be ethyl nicotinate, p-anisaldehyde, and linalool, and the optimum ratio of the components was determined to be 1:2:1. Beta-cyclodextrin was used as the wall formation material to screen out the optimal preparation conditions of beta-cyclodextrin microcapsules. The controlled-release performance of beta-cyclodextrin microcapsules was much better than that of other conventional controlled-release materials. Tests in the greenhouse showed that the attractant microcapsules had a better trapping effect on flower thrips, i.e., about three times higher than that of the traditional blue sticky traps. In conclusion, the developed attractant and its controlled-release microcapsules were shown to effectively attract flower thrips. This technique, therefore, has good application prospects in protecting agricultural and forestry production.