

Introduction

Efforts to control medfly pest relayed on bait sprays with toxic insecticides. The use of mass trapping in IPM strategies has proven to be efficient. However, there has been much debate regarding the potential undesirable attractant impacts on non-target organisms. Cera Trap®(CT) is a pesticide-free attractant based on a liquid protein mixture successfully used over the last fifteen years on citrus, pome and stone fruits as well as tropical and subtropical fruits.

Objectives

In order to better understand the mode of action of this lure, here we applied GC-EAD and coupled GC-MS to attempt the identification of individual physiologically active volatile compounds released by CT. In addition, the selectivity of CT was evaluated in a two-year field trials on two peach orchards assessing the efficacy in capturing medfly as well as non-target insects in comparison with a standard mass-trapping system (STD).

Electrophysiological identification

Material & Methods

2µl extracts were injected in HP 5890 GC interfaced with an EAG apparatus. Eluting compounds were delivered to the antenna through humidified air stream. Extracts were tested on: Immature virgin flies (1-2 days); mature virgin and mated flies (5-6 days).

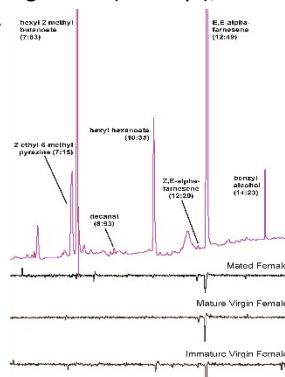


Fig 1, GC-EAD recording of female responses to CT extract

Results

Ten compounds that elicited an electrophysiological response on female's antennae were identified **Fig 1**. EAG responses to individual compounds revealed a dose-response relationship. EAG responses generated by CT concentrated extracts were higher in comparison with isolated synthetic compounds.

Field trials

Material & Methods

CT and STD system were placed in two peach orchards in Tunisia at 50 traps/ha. Two samplings every 4 weeks were performed. In each sampling 25 out of 50 traps were randomly checked.

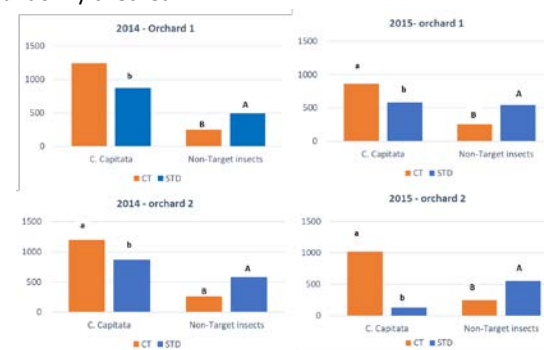


Fig 2, n° of medfly and non-target insects trapped by CT and STD. Different letters indicate significant differences (Poisson P < 0.001)

Results

In all cases, CT was more selective, capturing significantly lower number of non-target insects (including Chrysopidae, Coccinellidae, Miridae, Formicidae and Diptera) than STD system.

- The mean EAG responses generated by the concentrated Cera Trap® extracts are higher than any response to the isolated synthetic compounds tested.
- Selectivity results show that, in all cases, 'Cera Trap®' was found to be more selective toward non-target insect groups.