Response of *Anastrepha fraterculus* Wiedemann (Diptera:Tephritidae) to synthetic semiochemicals

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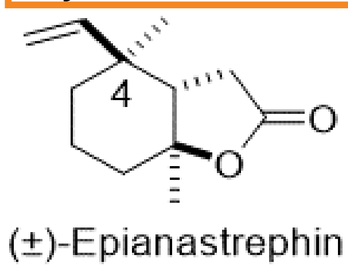
Background

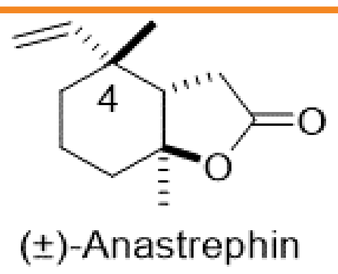
- ✓ Specific attractants are a powerful tool for pest management.
- ✓ Male borne volatiles from several *Anastrepha* species contain epianastrephin and anastrephin.
- ✓ The capacity to produce these compounds, as well as an epianastrephin analog with two methyl groups (dimethyl), opens a new possibility to develop a specific attractant within this genus.

Objective

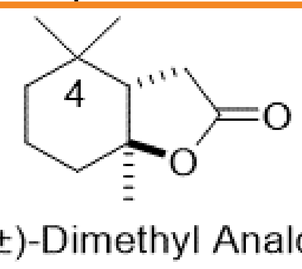
Determine the attractiveness of *Anastrepha fraterculus* males and females of different physiological status to synthetic semiochemicals in field cage experiments.



(±)-Epianastrephin



(±)-Anastrephin



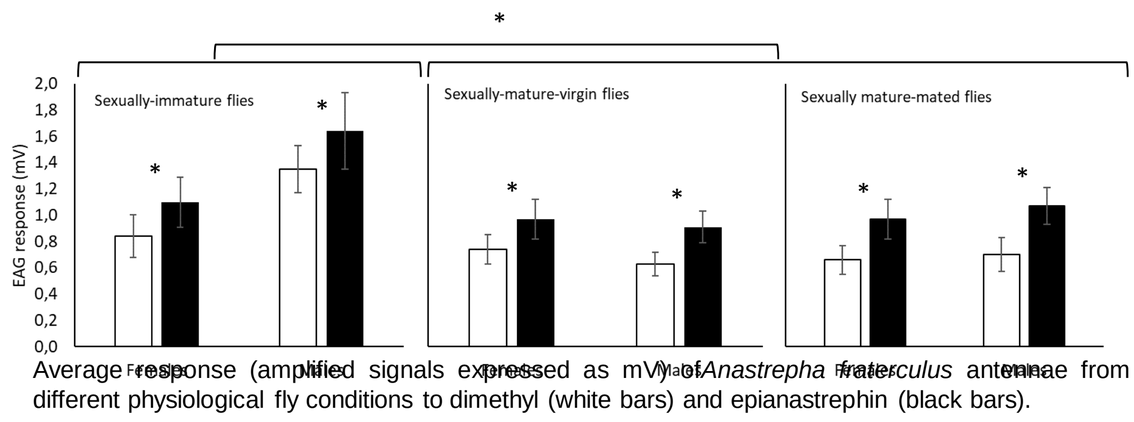
(±)-Dimethyl Analog

Material and methods

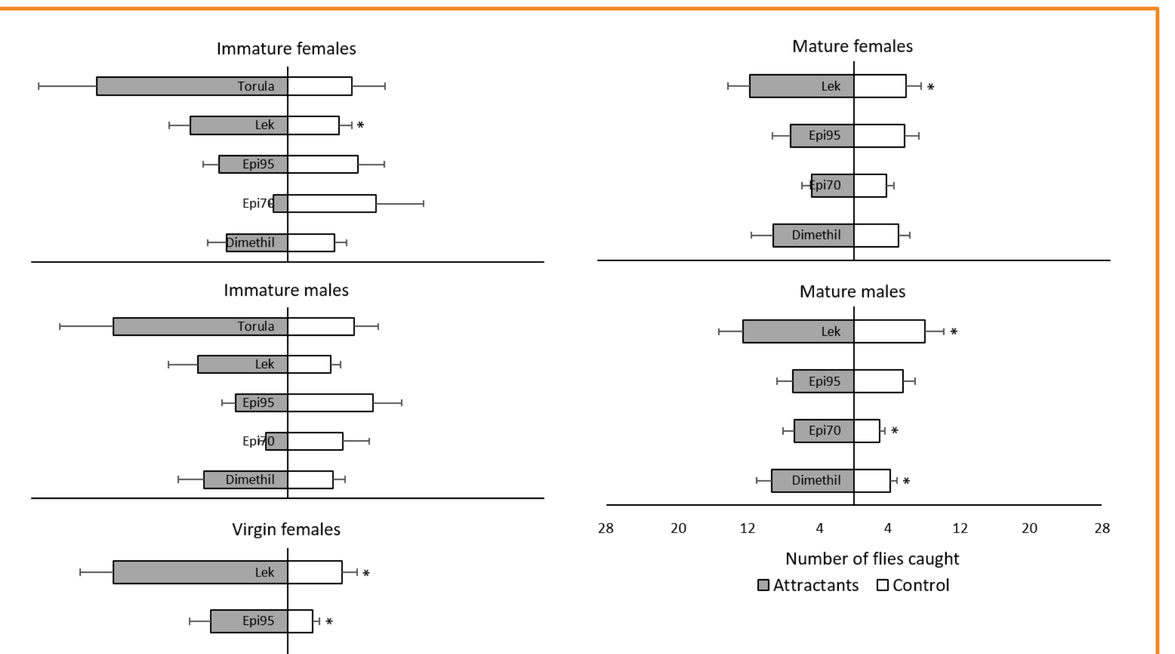
- ✓ Capacity to percieve the synthetic compounds was evaluated by means of electroantennographic analysis (EAG).
- ✓ Attraction was tested on immature males and females (3 days old), mature copulated males and females, and mature virgin females (10 to 14 days old) from a laboratory strain.
- ✓ One hundred flies of a given sex or mating condition were released in cylindrical field cages under natural conditions and left for 16 hours.
- ✓ Attractants were placed in McPhail traps (one trap with attractant and one trap with water per cage).
- ✓ Number of flies captured in each trap was recorded.
- ✓ Control cages contained a trap with five confined live mature males (leks).
- ✓ For immature flies, an additional positive control cage was set up with torula yeast.
- ✓ A liner model was built to analyze EAG response with sex, semiochemical and physiological condition as fixed factors.
- ✓ Field-cage data were compared using a Wilcoxon test for paired samples.

Results

- ✓ Epianastrephin and dimethyl were EAG+ for all the flies' conditions.
- ✓ Epianastrephin elicited the highest response for both sexes of all fly physiological conditions.
- ✓ Immature flies showed greater responsiveness than mature ones.
- ✓ Attractiveness in the field cage experiments was dependent of the sex and the physiological condition.
  - Immature flies showed attractiveness only to leks.
  - Virgin females and mated males showed attractiveness to leks, dimethyl and epianastrephin.
  - Mature-mated females showed attractiveness only to leks.



Average response (amplified signals expressed as mV) of *Anastrepha fraterculus* antennae from different physiological fly conditions to dimethyl (white bars) and epianastrephin (black bars).



Number of *Anastrepha fraterculus* caught in traps under field cage experiments. Immature flies, mature-virgin females and mature-mated flies were considered in separate experiments. Bars denote means values with SE

Conclusion

- ✓ The attraction observed to the leks suggests that the blend released by the calling males may contain host-like cues which could be acting as a sensory trap.
- ✓ Addition of some of these compounds may result in greater attraction.
- ✓ Dose response experiments are required to provide additional information to move a step forward and validate the results obtained in open field conditions.