Male Olive Fruit Fly Behavioral Responses to Environmental Cues and Female Sex Pheromone

Soledad Villamil, Ed Lewis, and Frank Zalom - Dep. of Entomology, UC Davis - 2011

Abstract

Olive fruit flies, *Bactrocera oleae*, display a daily mating rhythm. Being a monophagous species, we suspected that its phenology would be strongly linked with its host species, the olive tree. This study shows that there is a seasonal rhythm to male response to sex pheromone but it is not sychronous with the phenology of its host plant.

Introduction

Bactrocera oleae (Rossi), also known as the olive fruit fly (OLF), is the only tephritid fly where the female emits sex pheromone to attract the male. Most studies look at pheromone attraction mainly as a trapping/control technique. Our focus is on the underlying biology to determine when males are most attracted to the pheromone traps.

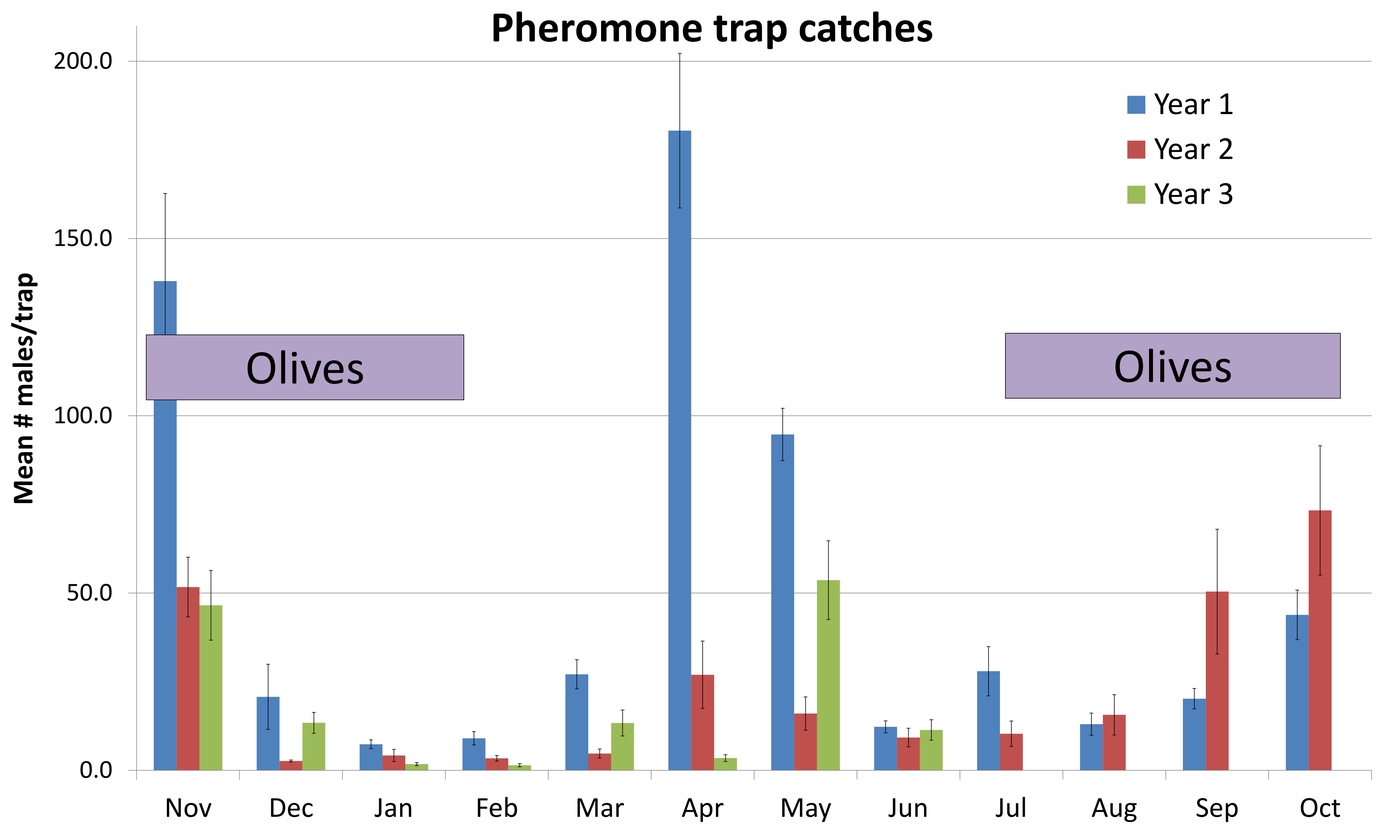
Hypothesis:

The phenology of the OLF will be linked with that of the olive tree, its host plant.

Materials & Methods

- 5 trees in olive orchard (Oroville, CA).
- Each tree 2 white cardboard sticky traps:
  - 24 pheromone capsules
  - No pheromone (control)
- Paired traps separated at least 3m.
- Traps checked weekly, every 10 days, biweekly, monthly, depending on the time of the year.
- Pheromone capsules: spiroketal provided by Vioryl SA.

Results



Year 1: 1 Nov 2007 - 25 Jun 2008
Year 2: 2 Jul 2008 - 2 June 2009
Year 3: 7 Jul 2009 - 23 June 2010

Year	1	2	3
Total	**2742**	**1092**	**1519**
Males	2728	1090	1515
Females	14	2	4

- Highest catches: 8-10 ♂♂/trap/day
- More common: <5 ♂♂/trap/day
- Two peaks/year:
  - early spring (mid-Apr to mid-May)
  - fall (Oct/Nov)
- McPhail (food-baited) traps catch ♂♂ and ♀♀mainly May-July
- Control trap catches negligible
- Suitable olives available mid-Jul to Feb

Discussion and Conclusions

- Two peaks of high male catches in field: early spring and fall.
- Peaks not synchronous with phenology of host plant.
- Spring peak when few flies are present → ideal for implementing mating disruption.

Future research

- When during the year do females emit pheromone?
- Will female pheromone production overpower/interfere with synthetic pheromone?