Other Nuisance Flies….Not to be Confused with Eye Gnats

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Common Nuisance Flies in So. California

Most Common Flies

- House Fly (*Musca domestica*)
- Garbage Flies (Calliphoridae)

Less Common Flies (But can be very abundant at some locations and times!)

- Fungus Gnats (Sciaridae and Mycetophilidae)
- Moth Flies (Psychodidae)
- Flesh Flies (Sarcophagidae)
- Cluster Flies (*Pollenia* spp)
- Stable Fly (*Stomoxys calcitrans*)
- Little House Fly (*Fannia canicularis*)
- Eye Gnats (*Hippelates* spp)
- Canyon Flies (*Fannia benjamini* complex)
- Trail Gnat (*Amiota picta*)

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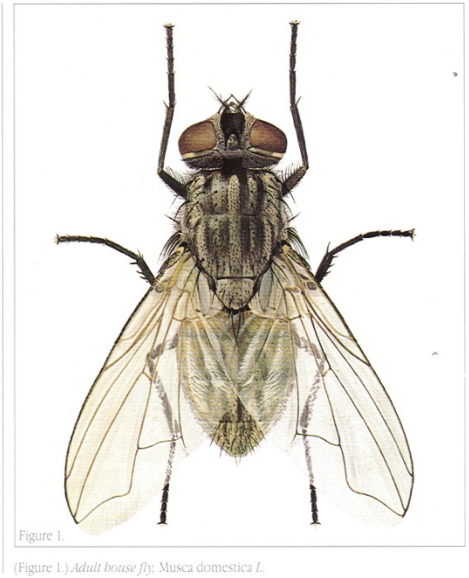

Figure 1.

(Figure 1.) *Adult house fly*. Musca domestica *L.*

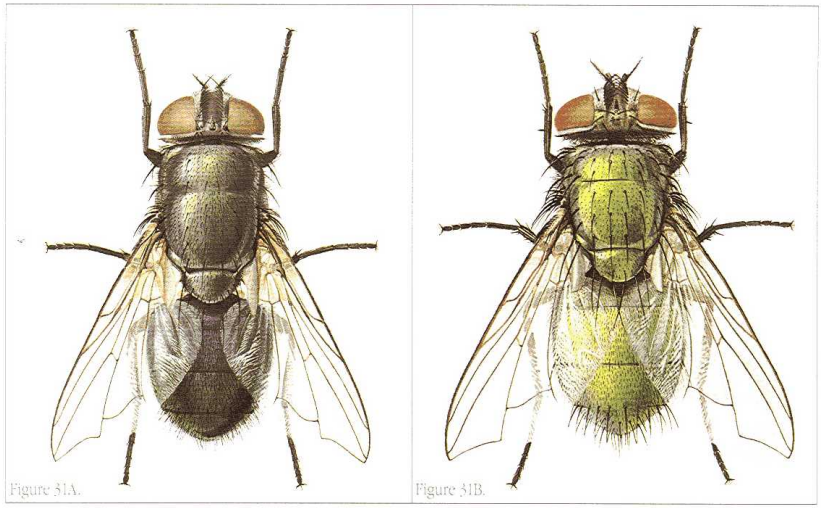

Figure 31A.

(Figure 31A.) Phormia regina, *black blow fly.*

Figure 31B.

(Figure 31B.) Phaenicia sericata, *green blow fly.*

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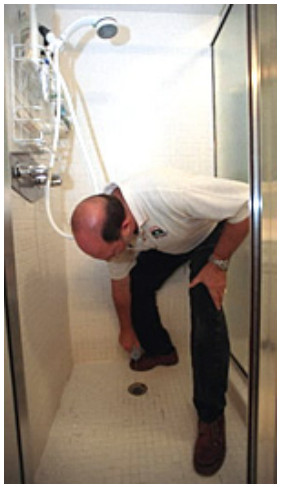
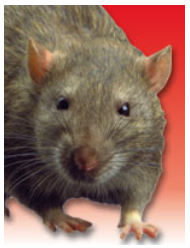
- Fungus Gnats (Sciaridae and Mycetophilidae)
- Moth Flies (Psychodidae)
- Flesh Flies (Sarcophagidae)
- Cluster Flies or Attic Flies (*Pollenia* spp)





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Common Nuisance Flies in So. California

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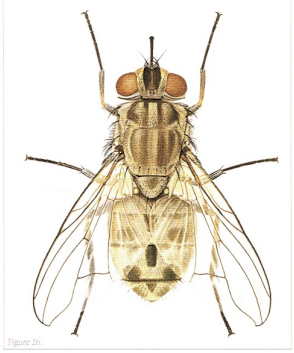

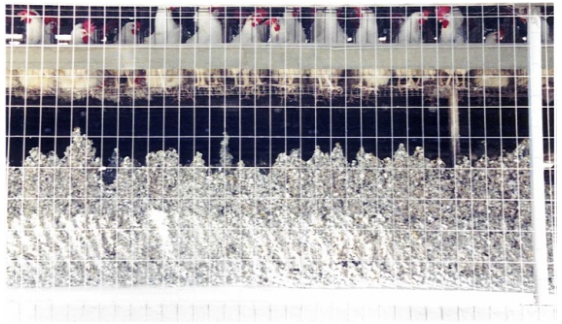

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Common Nuisance Flies in So. California

Less Common Flies (But can be very abundant at some locations and times!)

- Eye Gnats (*Hippelates* spp)
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Common Nuisance Flies in So. California

Less Common Flies (But can be very abundant at some locations and times!)

What about mosquitoes, biting gnats, black flies, etc…?

- Eye Gnats (*Hippelates* spp)
- Canyon Flies (*Fannia benjamini* complex)
- Trail Gnat (*Amiota picta*)

"Canyon Flies" – *Fannia benjamini* complex

- Species complex
  - 7 species native to CA
  - Identified by coloration and bristle pattern
    - All have yellow/orange colored antennae
- Common to CA foothill communities
- Temperate distribution
  - Sensitive to high temps
- Attracted to animals
  - Protein required to lay eggs

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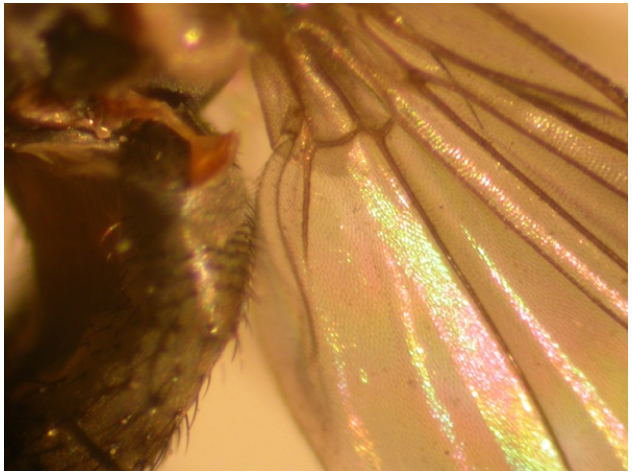
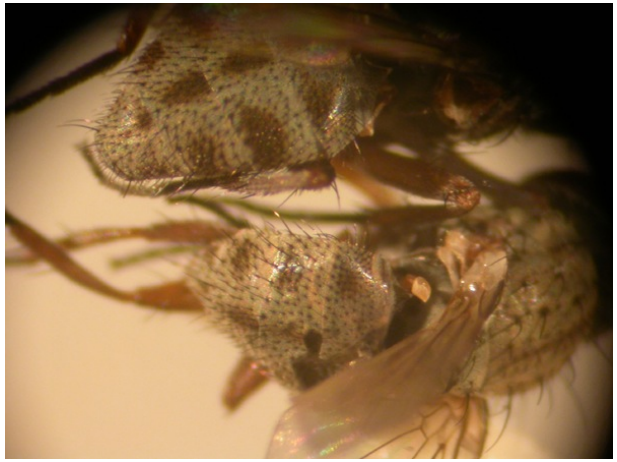
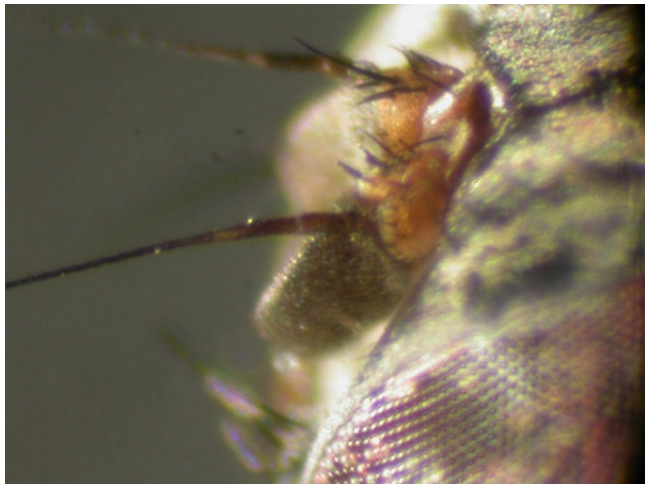
Recognizing “Canyon Flies”

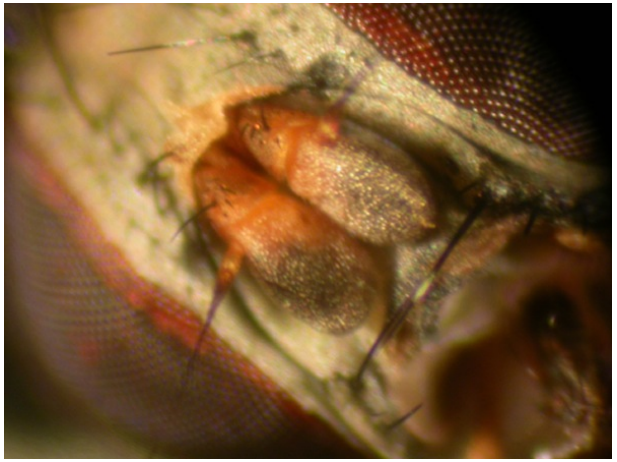


Anal wing veins (*Fannia*)



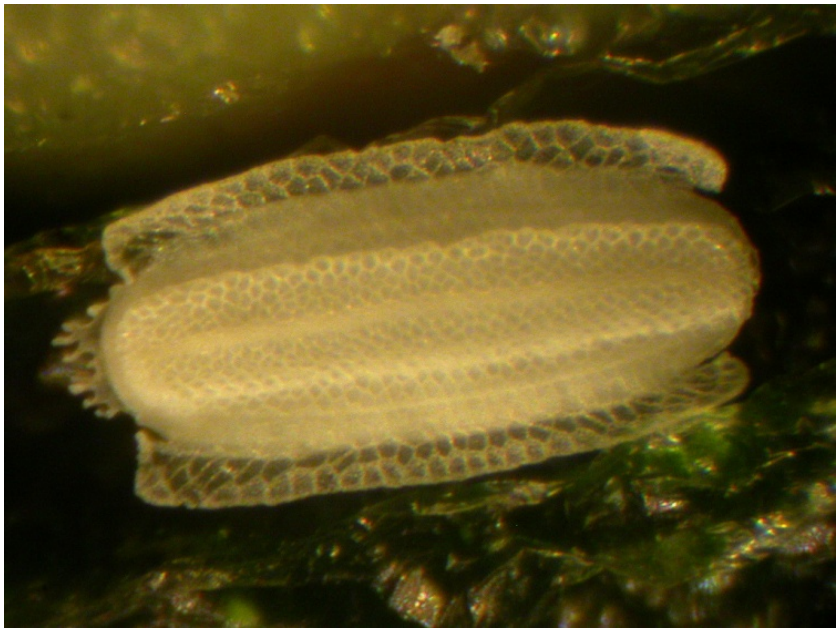
Spotted abdomen





Yellow/orange basal antennal segments (canyon fly)

Canyon Fly egg

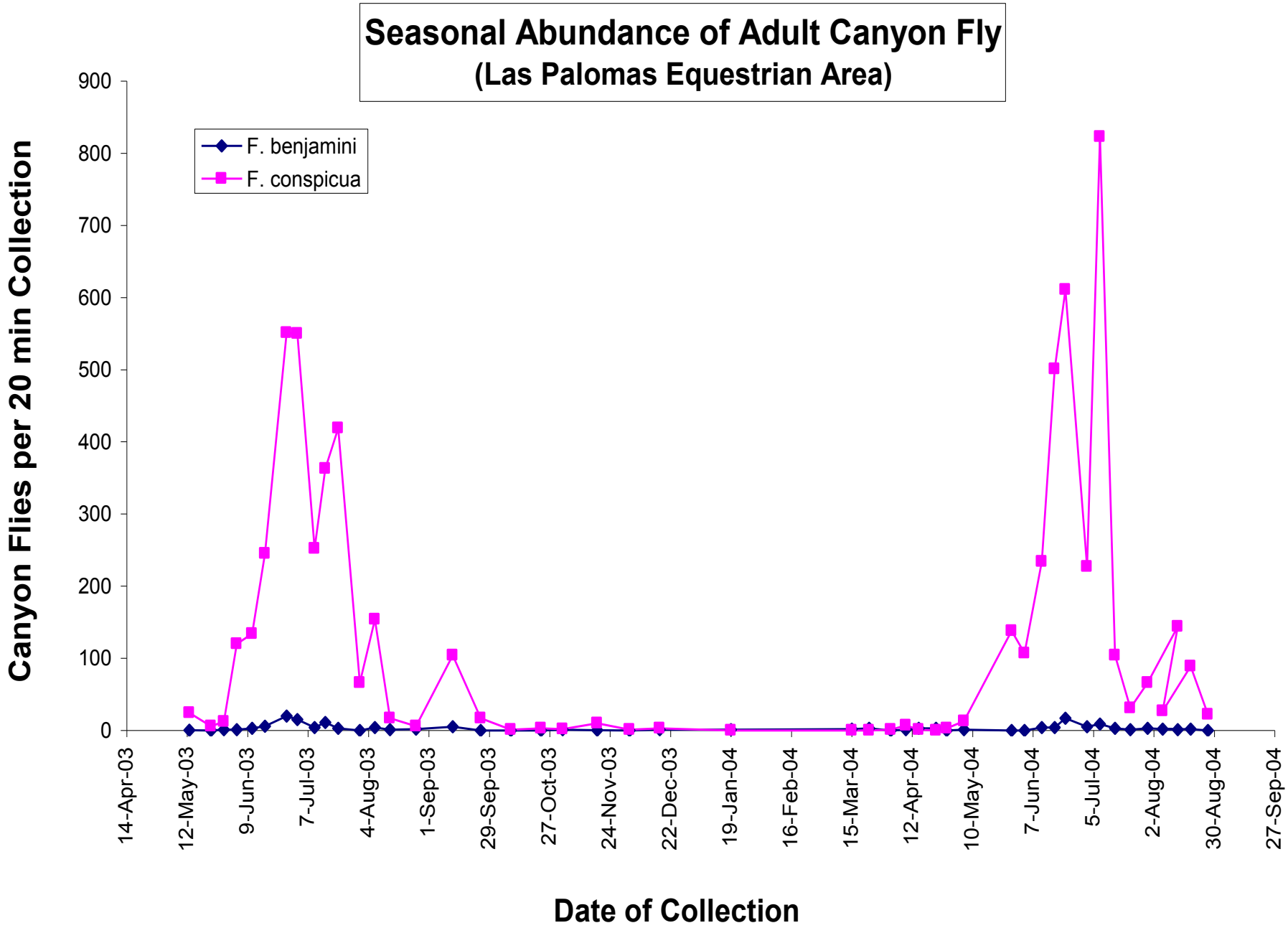


Canyon Fly larvae

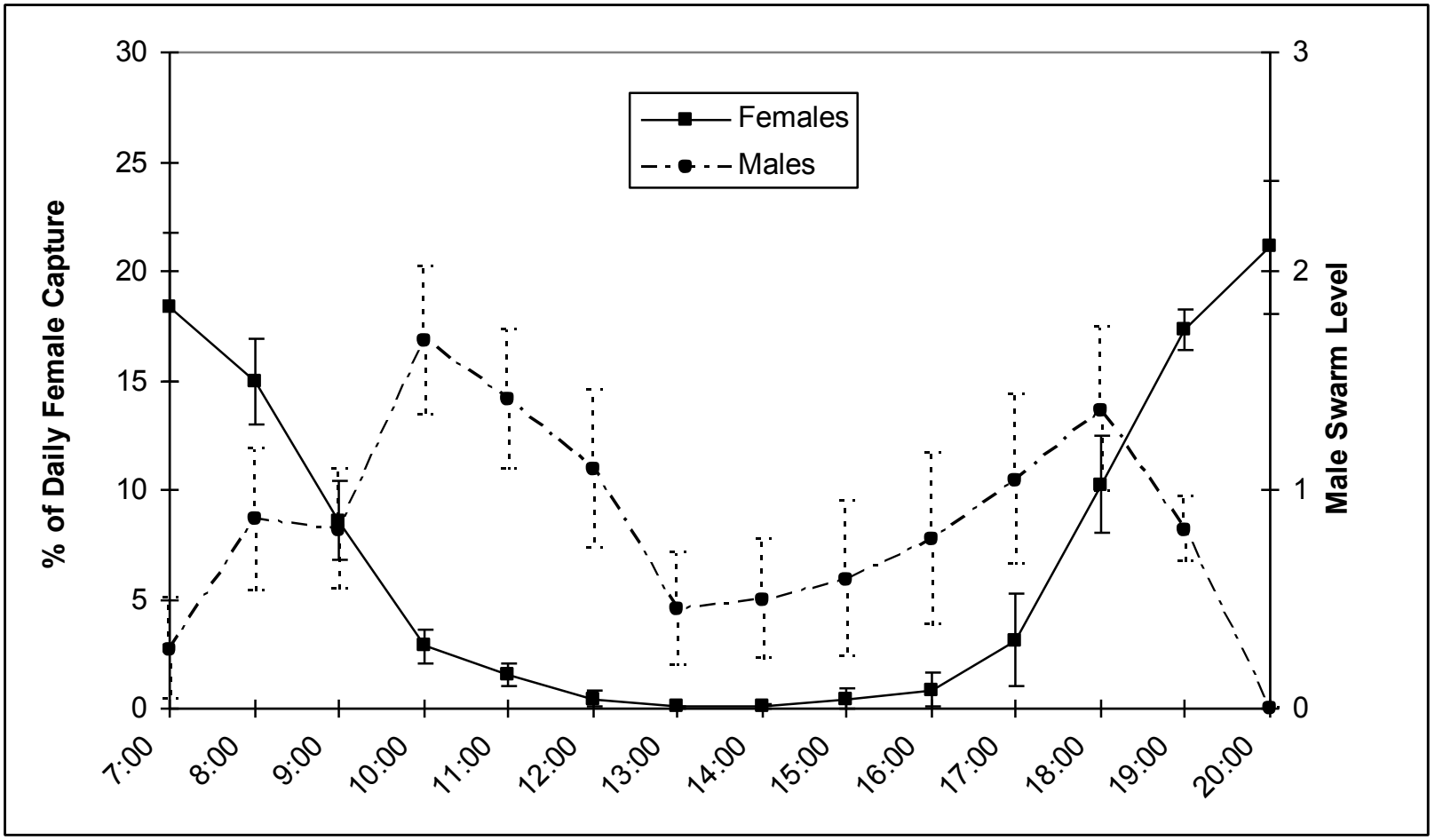
Human Interest

- Nuisance
  - Feed on body secretions (sweat, mucus, tears, etc…)
    - Not obligate blood feeders
    - Appear most attracted to areas of the human body with build-up of sweat odors
    - Only females attracted to host

- Vector of *Thelazia* eyeworms
  - *F. benjamini* associated with *Thelazia* transmission during the 1950's
  - Weinmann et al. (1974): a non-described species of the *F. benjamini* complex is only competent vector
    - Described as *F. thelaziae* (Turner) (1976)


Seasonal Abundance of Adult Canyon Fly
(Las Palomas Equestrian Area)
F. benjamini
F. conspicua
Canyon Flies per 20 min Collection
900
800
700
600
500
400
300
200
100
0
14-Apr-03
12-May-03
9-Jun-03
7-Jul-03
4-Aug-03
1-Sep-03
29-Sep-03
27-Oct-03
24-Nov-03
22-Dec-03
19-Jan-04
16-Feb-04
15-Mar-04
12-Apr-04
10-May-04
7-Jun-04
5-Jul-04
2-Aug-04
30-Aug-04
27-Sep-04
Date of Collection

Canyon Fly Activity Period



Adults shelter in midday and at night in nearby vegetation

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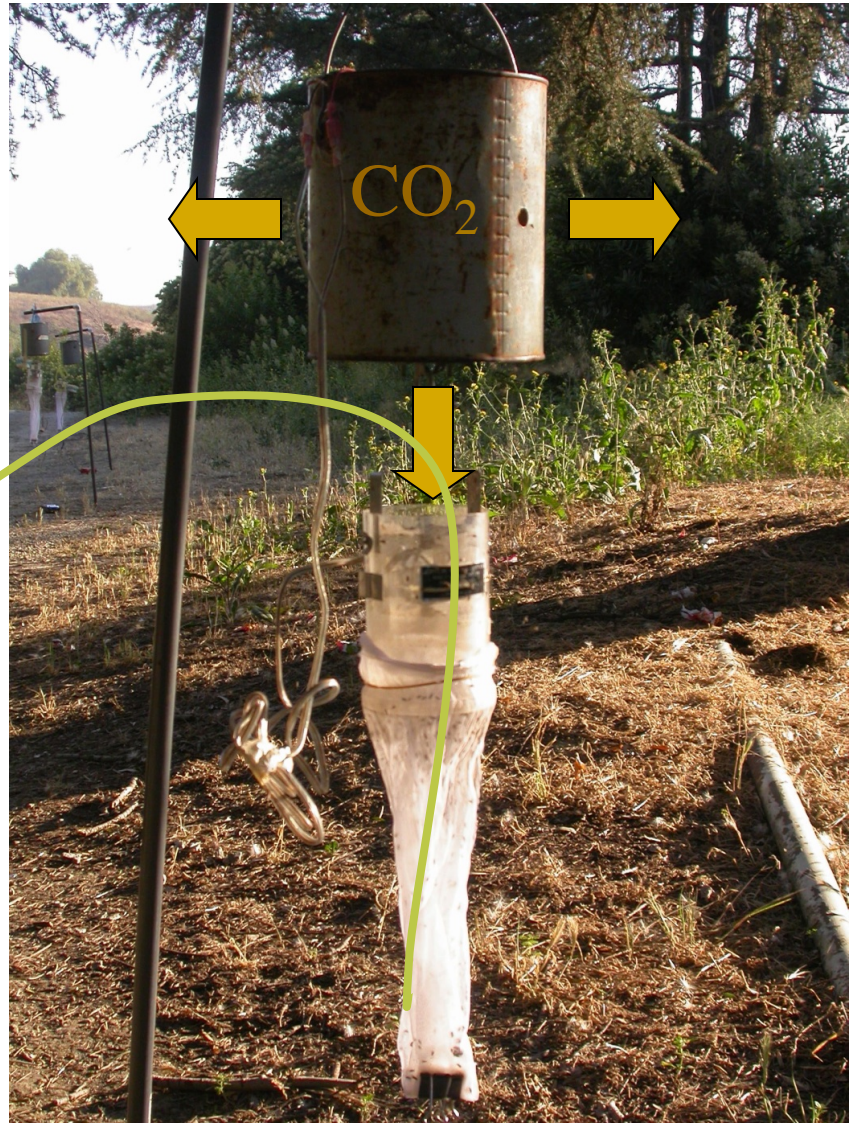
Response to host odors (note date and time)



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Carbon dioxide is very attractive!

- We removed over 6,000 flies in 4 hrs using 3 CO_2 traps at a single hilltop area

3,073 canyon flies!!

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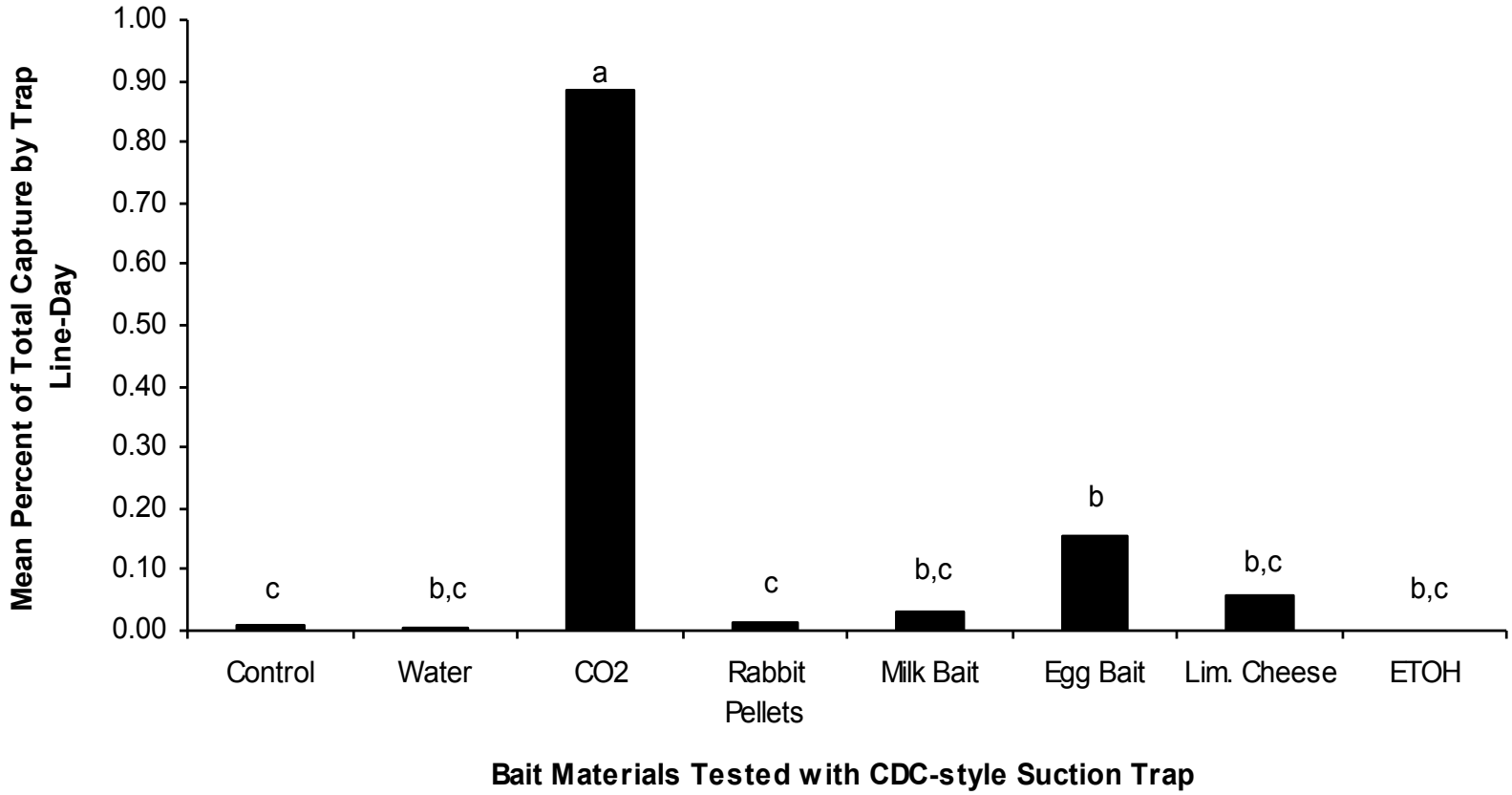
Mean Percent of Total *Fannia conspicua* Capture by Trap Line-Day for Some Common Bait Materials



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Additional Attractant Bait Studies

Trap synergism using host excretion products with carbon dioxide

Treatment	Actual Capture Mean ± SEM	% Capture Mean ± SEM	Rank
Ammonia (n=27)			H=92.38
Control	1.70 ± .64	0.09 ± 0.02c	C
Ammonia	10.59 ± 2.89	0.64 ± 0.18c	C
CO_2	635.33 ± 138.40	34.24 ± 2.28b	B
Ammonia & CO_2	1070.44 ± 121.45	65.03 ± 0.24a	A
Blood (n = 14)			H=42.43
Control	4.93 ± 3.57	0.19 ± 0.10	B
Blood	6.36 ± 1.92	0.35 ± 0.11	B
CO_2	1062.00 ± 291.28	51.42 ± 3.70	A
Blood & CO_2	944.14 ± 236.30	48.04 ± 3.76	A
Sweat (n=8)			H=24.99
Control	0.75 ± 0.49	0.08 ± 0.05	B
Sweat	1.00 ± 0.87	0.11 ± 0.09	B
CO_2	347.13 ± 73.17	62.68 ± 7.06	A
Sweat & CO_2	280.29 ± 58.59	42.43 ± 5.33	A

df= 3, $p < 0.05$.
Values followed by the same letter are not significantly different at $p < 0.05$.

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Canyon Fly Development Sites

- Some pest *Fannia* develop in bird feces
  - Also known to develop in decaying organic muck
- Native flies
  - Historically most common in native foothill habitats
    - Recent increases in developed areas (some species)
  - A few larvae found in woodrat nests

Red Apple
(*Aptenia cordifolia*)

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Red Apple is common in SoCal hillside communities

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Laboratory Colony

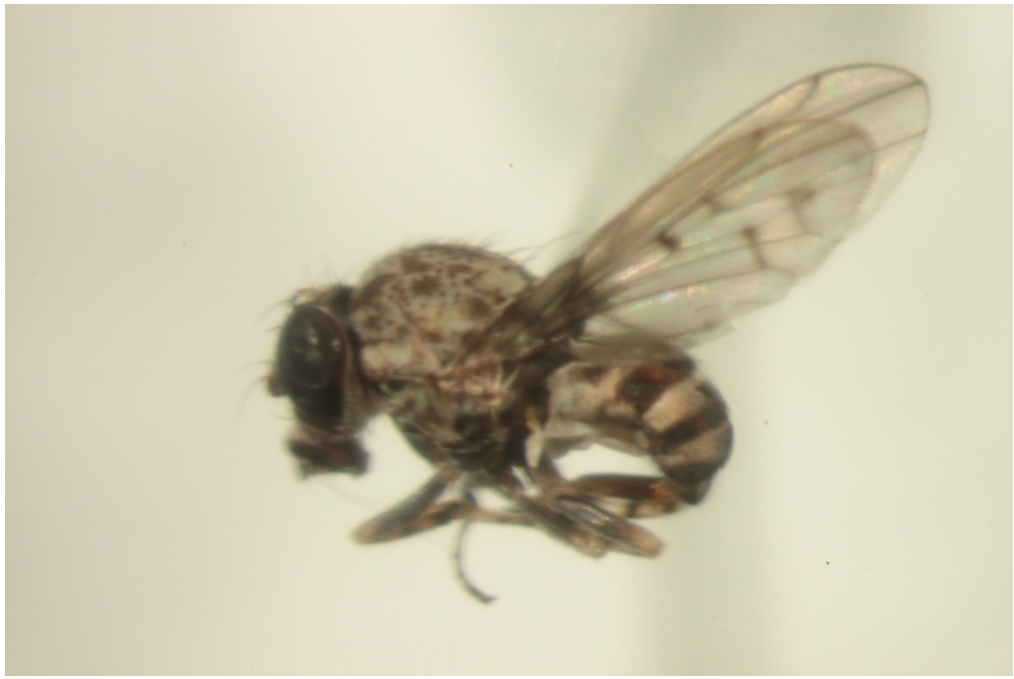
Native Developmental Sites?

- Red apple is an imported plant
  - Brought into CA in mid-80's
  - Not native developmental site for any "canyon fly"
- No other canyon fly larvae were collected during our studies
  - Native developmental sites are probably widespread with low larval density
    - Leaf litter, decaying plant material

Possibilities for Control

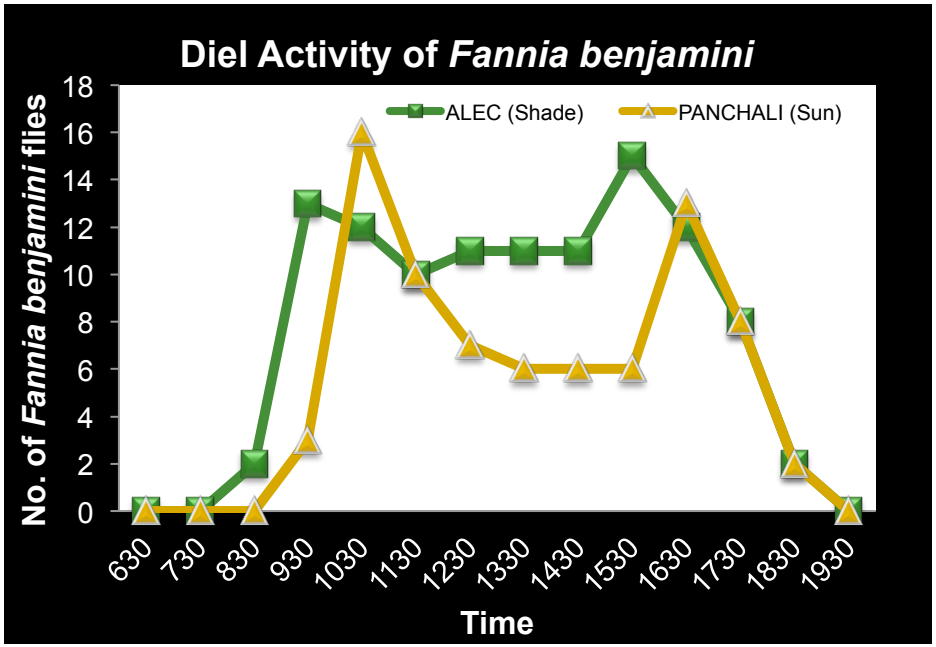
- Limited Developmental Habitat
  - Habitat Removal
    - Very expensive, vegetation replacement
- Attraction to CO_2 and other compounds
  - Trap-out Program
  - Protective Barrier
- Limited seasonality and daily activity
  - Personal or area-wide repellents
    - Avoid periods of highest fly activity

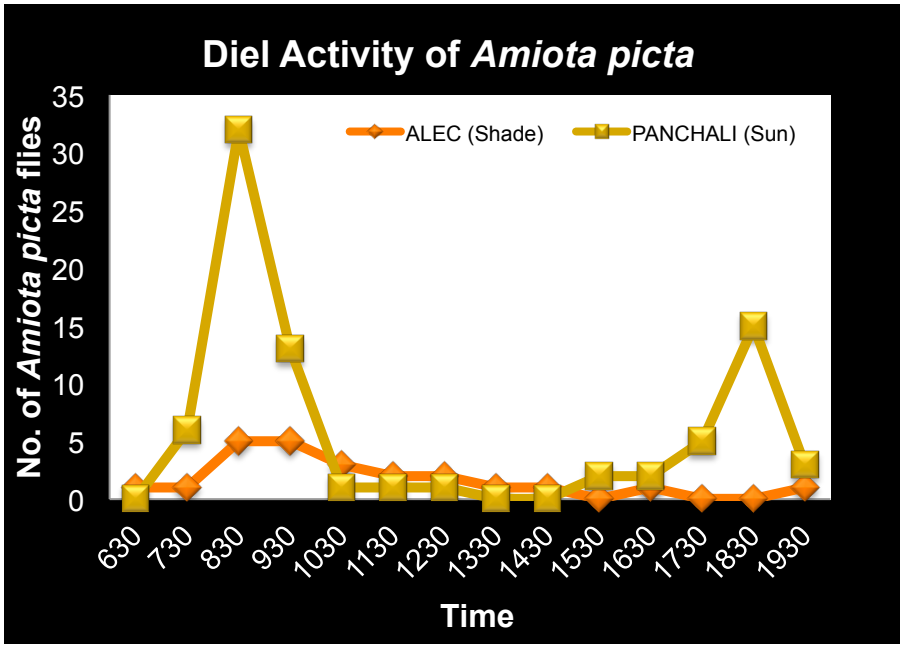
Canyon Fly (*Fannia benjamini)*
Family: Muscidae



Trail Gnat (*Amiota picta*)
Family: Drosophilidae

Nuisance Fly Activity – Carmel Valley





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THE SOUTHE
OG BORER
Anaerobus
californicus
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