Indoor Flies

....and a few other things at the end
There are typically 3 larval stages. The last one will normally wander from the food source.
“Big Flies”
Blow Flies

Diptera: Calliphoridae
Common Scavenging Species of Blow Flies

Black blow fly

Blue bottle flies

Green bottle flies
Most blow flies develop on carrion

(animal manure may be another breeding material for some species)
Green bottle flies often are associated with animal feces but may develop in carrion.
Maggots crawling in the home?

Likely source is a dead animal behind a wall or elsewhere in the home.
If animals die within a building, blow flies will often find them. This may be followed by wandering maggots, later lots of adult flies in the building.

INFESTED BRITAIN Summer heatwave and cheap rat poison has sparked a plague of MAGGOTS in the UK

Peter Higgs, who runs PGH Pest Control and Prevention, tells Sun Online he has received an unprecedented number of call outs to deal with maggots over the past week.

Maggots dropping from our ceilings

“We’ve had at least a hundred calls over the summer. That’s more than double what we’d normally receive,” he says.

“It’s not just maggots in bins, they’re dropping from the ceiling in homes and shops.”

This may be followed by wandering maggots, later lots of adult flies in the building.
The last stage larva, when it has finished feeding, will usually wander from the food.
Garbage in Dumpster – How quickly could flies develop in this source?
Critical concern: How long between when eggs are laid until full-grown larvae migrate to sites for pupation?
Garbage in Dumpster – How quickly could flies develop in this source?

Assumption: Temperatures during the day are warm enough for adult flies to be active (above 50F) and lay eggs

Assumption: Temperature in the pile is at 72F
<table>
<thead>
<tr>
<th>Species</th>
<th>No. of Gen.</th>
<th>Egg</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>Prepupa</th>
<th>Pupa</th>
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</thead>
<tbody>
<tr>
<td>S. cooleyi</td>
<td>25-30</td>
<td>24</td>
<td>18</td>
<td>48</td>
<td>96</td>
<td>9</td>
<td></td>
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<tr>
<td>P. regina</td>
<td>23-25</td>
<td>12</td>
<td>15</td>
<td>10</td>
<td>50</td>
<td>56</td>
<td>10</td>
</tr>
<tr>
<td>C. vomitoria</td>
<td>22-31</td>
<td>25</td>
<td>24</td>
<td>50</td>
<td>52</td>
<td>98</td>
<td>24</td>
</tr>
</tbody>
</table>
Interval between egg laying and end of 3\textsuperscript{rd} instar (at 71.6 degrees F)

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Sarcophagid fly – 3.75 days

Black blow fly – 3.6 days

Blue bottle fly – 6.4 days
Development (hours) of *Lucilia sericata* at different temperatures

<table>
<thead>
<tr>
<th>Life stage</th>
<th>7.5</th>
<th>10.0</th>
<th>12.5</th>
<th>15.0</th>
<th>17.5</th>
<th>20.0</th>
<th>22.5</th>
<th>25.0</th>
<th>27.5</th>
<th>30.0</th>
<th>32.5</th>
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<tbody>
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<td>Egg–1st</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>17</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1st–2nd</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>28</td>
<td>19</td>
<td>14</td>
<td>11</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>2nd–3f</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>39</td>
<td>26</td>
<td>20</td>
<td>16</td>
<td>13</td>
<td>11</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>3f–3m</td>
<td>143</td>
<td>143</td>
<td>143</td>
<td>71</td>
<td>48</td>
<td>36</td>
<td>29</td>
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<td>18</td>
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<td>3m–Pupal</td>
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<td>167</td>
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<td>42</td>
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<tr>
<td>Pupal–Adult</td>
<td>527</td>
<td>527</td>
<td>527</td>
<td>263</td>
<td>176</td>
<td>132</td>
<td>105</td>
<td>88</td>
<td>75</td>
<td>66</td>
<td>59</td>
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</tbody>
</table>
Period of time between egg laying and wandering larvae of the green bottle fly

- **Average temperature 59°F**
  - Egg-wandering: 155 hours
  - Period of wandering: <167 hours

- **Average temperature 68°F**
  - Egg-wandering: 79 hours
  - Period of wandering: <84 hours

- **Average temperature 77°F**
  - Egg-wandering: 52 hours
  - Period of wandering: <56 hours
Control of Blow Flies in the Home

• Eliminate breeding sites in and around the building
• Seal/Screen to exclude flies originating from outdoors
• Traps?
Fly Traps for Blow Flies?
– Attractive to adults, yes.
Help with overall control - maybe, maybe not.
Sticky Fly Traps?

May capture some flies, particularly house flies, if placed in location where flies congregate.
Blow flies in homes in winter months

Cluster flies

Blue bottle flies
Cluster Flies
*Pollenia* spp.

The most common indoor flies during the cool months
Curly golden hairs mark cluster flies
Cluster flies are parasites of earthworms – they are not ‘filth flies’
Cluster fly searching for a site to lay eggs
Scenario for Cluster Fly Invasion of a Building

- Flies move to sunlit vertical surfaces when during period when seeking winter shelter
- Flies move upward as sun sets
- Flies enter upper areas of building, cluster behind walls
Management of Cluster Flies

• Prevention
  – Seal all openings prior to time when cluster flies enter buildings
  – Insecticides can be applied to exterior around openings
  – Drying dusts can be blow in into wall voids to kill flies behind walls.
Management of Cluster Flies

• Coping
  – Explain nature of problem
    • Transient nuisance invader
    • Self-limiting; no breeding occurs indoors
    • Not a filth fly
  – Vacuum individuals as they are observed
Fly Traps for Cluster Flies?
– They are not responsive to fly trap lures
Sticky Fly Traps?

May capture some flies, if placed in location where flies congregate
“Medium-Sized Flies”
House Fly (*Musca domestica*)
House flies breed in many materials but decaying vegetable/fruit material is favored.
Sticky Fly Traps?

May capture some flies, particularly house flies, if placed in location where flies congregate.
Ceroxys latiusculus – A picture-winged fly that commonly enters buildings in autumn.

Larvae develop in plants of the genus Senecio.
“Small Flies”

- Humpbacked flies
- Fungus gnats
- Vinegar flies/Small fruit flies
- Moth flies
Vinegar/Small Fruit Flies

Diptera: Drosophilidae
Small fruit fly larvae developing in overripe peach
TIME FLIES LIKE AN ARROW; FRUIT FLIES LIKE A BANANA.

Groucho Marx
American Comedian
1890 - 1977
Vinegar fly larvae develop on yeasts that grow on overripe fruit or in other sources of damp vegetable matter.
Residue in containers, such as those kept for recycling, can support larvae of small fruit flies.
Control of Small Fruit Flies/Vinegar Flies in the Home

• Eliminate all sources of breeding material
  – Remove, promptly consume or refrigerate all susceptible fruits
  – Clean out any residues that may allow yeasts to grow

• Trap out residual adults
A simple vinegar ("fruit") fly trap

Note: Adults may live close to a month, so trapping and exclusion must be sustained for weeks.
Fungus Gnats

Diptera: Mycetophiliidae,
Adult fungus gnats usually live for only 4-5 days. Females lay eggs in soil cracks along surface.
Fungus gnat larvae require 3-4 weeks or more before being full grown. They primarily eat fungi and decaying plant matter.
Fungus gnat larva on a potato slice
Fungus Gnat – Cultural Controls

- Reduce watering frequency
- Eliminate sources of decaying vegetation
Larvae of fungus gnats feed primarily on fungi.

Potting soil that remains moist is most favorable to fungus gnats.
Biological Controls for Fungus Gnat Larvae

- Soil predator mite (*Hypoaspsis miles*)
- Entomopathogenic nematodes (*Steinernema feltiae*)
- *Bacillus thuringiensis* var. *israelensis* (Bti)
Several strains of Bt are sold. Each is specific in the type of insect it can control:

- *kurstaki, aizawi* strains (leaf feeding Lepidoptera larvae)
- *tenebrionis* strain (leaf beetles)
- *israelensis* strain (mosquito, gnat, black fly larvae)
Mosquito bits label has been changed to now allow use for fungus gnats in house plants.
Psychodidae

Drain Flies/Moth Flies

Associated with bacterial slime coating surfaces of drains in buildings.
Larvae of the moth flies are associated with bacterial slime coating surfaces of drains in buildings.
Humpbacked flies aka drain flies, phorid flies

Diptera: Phoridae
Larvae of humpbacked flies live in moist, semi-solid media. This can occur in drains, or sometimes occurs when there has been a break in plumbing.
Control of Drain Flies

- **Identify source of origin**
  - Clean drains in a manner that eliminates food sources
    - Cleaning must remove all debris, surface film of bacterial slime
      - Normal drain cleaners insufficient
      - Drain cleaners that foam, break down debris can be effective
      - Scrubbing out drain can be useful
  - Fix leaking, cracked plumbing, if necessary
A sticky card placed over a drain can determine if it is the source of the flies
Control of Drain Flies

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- Clean drains in a manner that eliminates food sources
  - Cleaning must remove all debris, surface film of bacterial slime
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Control of “Drain Flies”

• Identify source of origin
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  – Cleaning must remove all debris, surface film of bacterial slime
    • Normal drain cleaners insufficient
    • Drain cleaners that foam, break down debris can be effective
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• Fix leaking, cracked plumbing, if necessary
Humpbacked flies aka drain flies, phorid flies
Diptera: Phoridae

Small dung flies
Sphaerocerid flies
Diptera: Sphaeroceridae
Small dung flies/ Sphaerocerid flies

May develop at sites where large amounts of moist decaying organic matter is present

Small dung flies on a dime
Indoor Flies
The conenose bugs

Triatoma spp.

–aka “Kissing bugs”
Triatoma sanguisima feeding on the food of a rodent
Chagas Disease

Causal Agent: *Trypanosoma cruzi*

Insect Vector: *Triatoma* spp.
CDC warns of blood-sucking 'kissing bug' sighted in Colorado

The "kissing bug" – which bites people around their mouth and can pass along the fatal disease Chagas – is making its way north and has been reported in Colorado.

Author: Associated Press
Published: 11:01 AM MDT April 25, 2019
Updated: 4:35 PM MDT April 25, 2019

FORT COLLINS, Colo. (AP) - A blood-sucking bug that can spread disease and is nicknamed for biting people around their mouths has been sighted in Colorado.

The Coloradoan reports the Centers for Disease Control and Prevention says the "kissing bug," or Triatoma sanguisuga, has been making its way into the U.S. from South and Central America.

Unwelcomed advances from “kissing bugs” in Colorado

Posted by editor on in Local News | 6 Comments

By Amber McIver-Traywick

The Surveyor

Although they aren’t new to Colorado, Triatoma protracta, one of 11 species of insects commonly called “kissing bugs” are making headlines, along with their insect relatives, as they all can carry a potentially deadly parasite increasingly found in the United States. The parasite, *Trypanosoma cruzi*, is transmitted by the kissing bug and results in Chagas disease or American trypanosomiasis, and health officials in Colorado want residents to be on the lookout for the infection-spreading pest.

Kissing bugs generally like to live near rocks, wood or brush piles or under bark. They are often found near rodent nests or other animal burrows, including outdoor pet kennels, as they prefer being close to a food source. The bugs are primarily nocturnal pests that hide during daylight hours and feed on the blood of warm-blooded animals during the night.
There was a lot of crap about kissing bugs on the internet

A Parasitic Bug Has Been Spotted Throughout Colorado And Its Bite Can Be Deadly

A few months ago we discovered that summer 2019 was going to be notoriously bad for ticks and mosquitoes (you can find a quick recap of that here) and today we are here to deliver even more bad news, as Colorado is being infested with a potentially deadly bug. While this insect may look and sound innocent enough, its bite can be fatal, which is why we recommend keeping your eyes peeled for the “Kissing Bug.” Here’s what you should know:

Spotted around the bottom half of the United States (including Colorado) is a pesky little creature called the Triatominae; a native to South and Central America that is slowly migrating north and wreaking havoc along the way.
Photos illustrating this article
Don't let this creepy-crawly deter your summer; remain aware, and you will have a safe and fun Colorado summer!

Have you come into contact with any unusual bugs this summer, or even this deadly kissing bug? Let us know in the comments! While you are out and about, make sure to keep your eyes peeled for These 12 Bugs Found In Colorado Will Send Shivers Down Your Spine.
Chagas disease and Kissing Bugs

What is Chagas disease?

Chagas disease is caused by a single-celled parasite, *Trypanosoma cruzi* and is most commonly spread in Mexico, Central and South America. Local spread may occur in the U.S., but it is not common.

Chagas disease has two phases. The acute phase usually goes unnoticed because most people have no symptoms or only have a mild illness that occurs 1-2 weeks after exposure. Sometimes, the only sign of exposure is a swollen eyelid on one side of the face where the bug bit. The chronic phase can occur in a small number of people years to decades after exposure. Chronic Chagas disease may result in severe illness.

How does Chagas disease spread?

- Blood-feeding insects called triatomine bugs (kissing bugs) are the most common way Chagas disease spreads. The parasite lives in the bug’s gut and is spread through its feces (poop). The bug bites, then defecates (poops).
The “kissing bug” of Colorado

*Triatoma protracta* (western conenose)
Kissing Bugs in Colorado

• One species of “kissing bug” is known from Colorado (*Triatoma protracta*)
  – Found in extreme western Colorado
  • One historical account from Gilpin County mining camp
  – Poor vector for transmitting Chagas disease
Kissing Bugs in Colorado

- One species of “kissing bug” is known from Colorado (*Triatoma protracta*)
  - Found in extreme western Colorado
  - Poor vector for transmitting Chagas disease

- Chagas disease has been detected in this species in Colorado
  - Found in *T. protracta* and in wild animal hosts (mostly woodrats)
Kissing Bugs in Colorado

- One species of “kissing bug” is known from Colorado (*Triatoma protracta*)
  - Found in extreme western Colorado
  - Poor vector for transmitting Chagas disease
- Chagas disease has been detected in this species in Colorado
- There has never been a human case of Chagas disease originating from Colorado
Masked Hunter

*Reduvius personatus*
Masked Hunter

- Develops as a predator of other insects
- May be found in homes year round; adults present in summer
- Can produce a very painful bite
Nymphs of the masked hunter cover themselves with debris ("walking dust balls")
Female/male western conenose bug

Female/male masked hunter
Internet is a Menace!

**Western conifer seed bug** – Very often found in CO homes. Absolutely harmless to humans.

**Kissing bug** – NOT found in CO homes. May transmit Chagas disease to humans.
Internet is a Menace!

**Masked hunter** – Often found in CO homes. NO medical importance to humans.

**Kissing bug** – NOT found in CO homes. May transmit Chagas disease to humans.
Note on Fleas, Foxes and Rabbits
What fleas occur in homes in Colorado?

- **Human flea**
  - Skunks, fox primary host
  - Does not breed indoors

- **Haplopyllus species**
  - Rabbits, squirrels primary hosts
  - Does not breed indoors

- **Cat fleas**
  - Dogs, cats primary hosts
  - Rarely breeds indoor in CO (too dry); common elsewhere
Physical Features of the Order

Eggs
(white; 0.5 mm long)
Eggs laid on pet (25 - 40 eggs per day). Eggs fall off pet and hatch in environment. Hatch in 2 - 5 days.

Adult
(Female: 4 mm long)
(Male: 2 - 3 mm long)
Take several blood meals daily.

Life Cycle of the
Cat Flea
Ctenocephalides felis

Pupa
(2 - 4 mm long)
Pupa in silk cocoon with debris collected on outside. Fleas emerge 1 - 2 weeks in environment. Delayed emergence up to 4 months.

First Stage Larva
(1 - 2 mm long)

Second Stage Larva
(2 - 3 mm long)

Third Stage Larva
(3 - 5 mm long)
Larvae
- Elongate/wormlike in form
- Chewing mouthparts
- Mostly feed on the dried, digested blood excreted by the adult fleas
Why are fleas uncommon in Colorado homes?
It is too dry to support the Immature stages (eggs, larvae, pupae)

Life Cycle of the Cat Flea
Ctenocephalides felis

- **Adult**
  - (Female: 4 mm long)
  - (Male: 2 - 3 mm long)
  - Take several blood meals daily.

- **Eggs**
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- **First Stage Larva**
  - (1 - 2 mm long)

- **Second Stage Larva**
  - (2 - 3 mm long)

- **Third Stage Larva**
  - (3 - 5 mm long)
Human flea —
Commonly associated with dens of foxes and skunks
Sarcoptic Mange – and canine distemper – have devastated populations of red fox in Fort Collins over the past several years.
With decreased foxes, rabbits and squirrels have increased. Incidence of fleas in homes associated with rabbits has also increased.
Hosts of Fleas in CO Homes

Cat flea – cats, dogs (rare in CO)

Rabbit flea – rabbits. Related species on squirrels.

Human flea - cats, dogs, fox, skunks - even owls and ducks

Unchanged, rare in CO
Sausage shrine produced by ants
This was not a funeral honoring the bee. The ants were surrounding it with available debris to hide it – so they could cut it up and bring it back to their nest for food!