

Indoor Flies and Ants

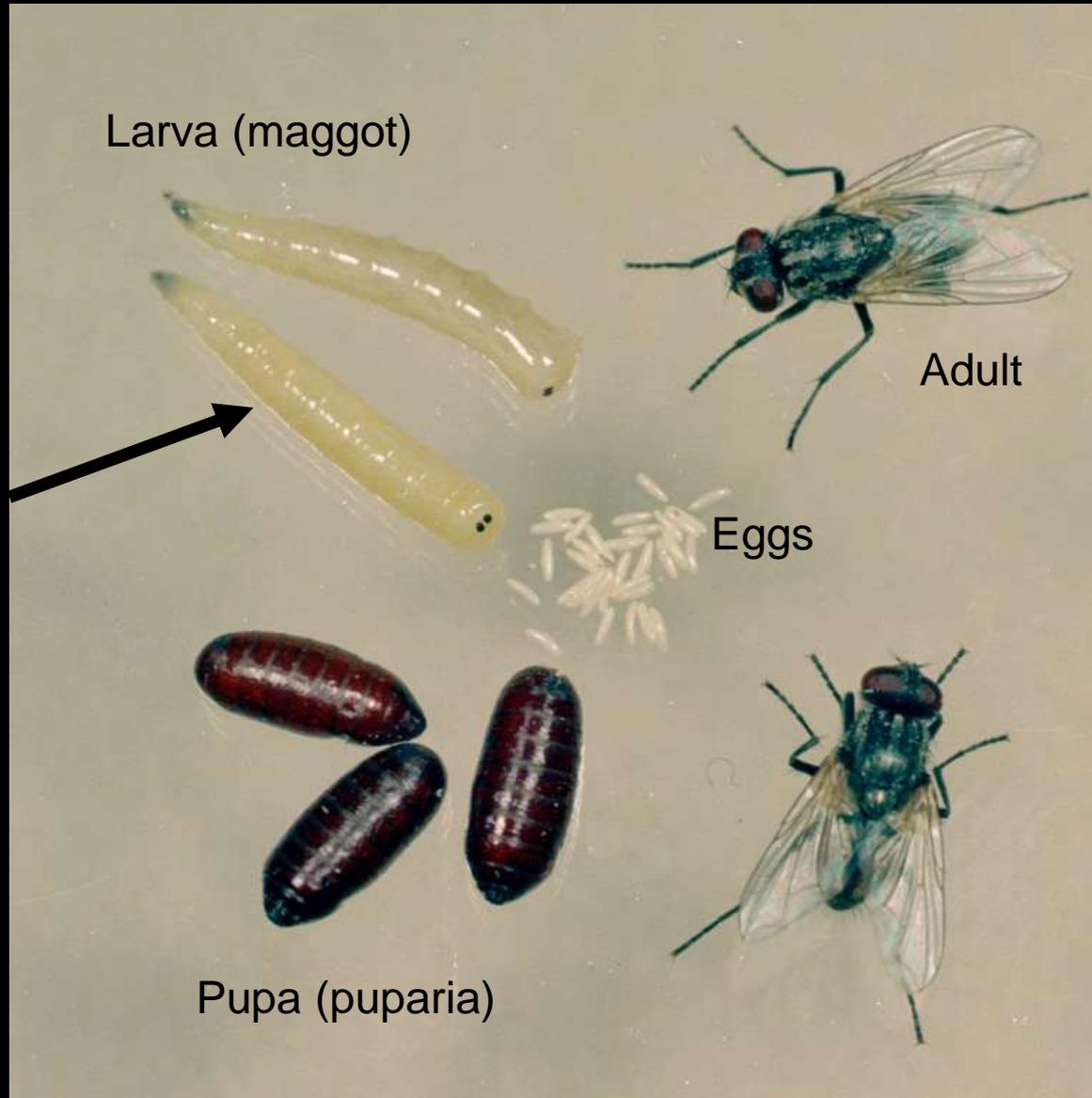


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Colorado State University

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General Life Cycle of Flies

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

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

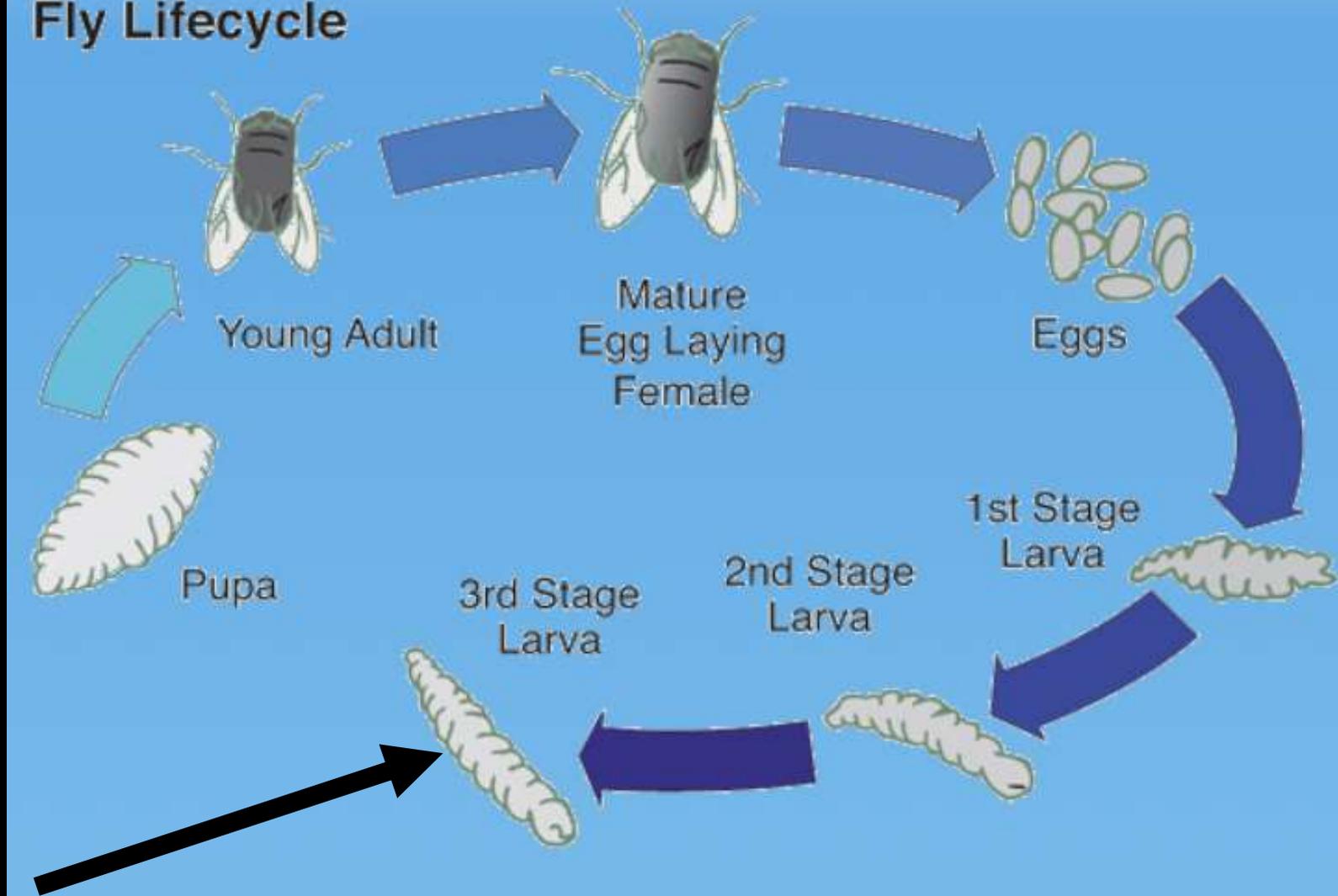
"We've had at least a hundred calls over the summer. That's more than double what we'd normally receive," he says.

"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

Fly Lifecycle



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?



Larva (maggot)



Eggs



Adult

Critical concern: How long between when eggs are laid until full-grown larvae migrate to sites for pupation?



Pupa (puparia)





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

Insects are cold-blooded, and their **rate of development depends on the temperature around them.**

This is a table of how long it would take – **in hours** – for 3 common kinds of flies to develop **if the temperature averaged 22C/71.6F**

Life History of Certain blowflies and fleshflies reared at 22°C
(Hours)

Species	No. of Gen.	Egg	1st	2nd	3rd	Prepupa	Pupa
<u>S. cooleyi</u>	25-30		24	18	48	96	9
<u>P. regina</u>	23-25	12	15	10	50	56	10
<u>C. vomitoria</u>	22-31	25	24	50	52	98	24

Interval between egg laying and end of 3rd 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



Life stage	Temperature °C										
	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5
Egg-1st	35	35	35	17	12	9	7	6	5	4	4
1st-2nd	56	56	56	28	19	14	11	9	8	7	6
2nd-3f	79	79	79	39	26	20	16	13	11	10	9
3f-3m	143	143	143	71	48	36	29	24	20	18	16
3m-Pupal	335	335	335	167	112	84	67	56	48	42	37
Pupal-Adult	527	527	527	263	176	132	105	88	75	66	59

Period of time between egg laying and wandering larvae of the green bottle fly

- **Average temperature 59F**
 - Egg-wandering **155 hours**
 - Period of wandering **<167 hours**
- **Average temperature 68F**
 - Egg-wandering **79 hours**
 - Period of wandering **<84 hours**
- **Average temperature 77F**
 - 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**





Earthworms

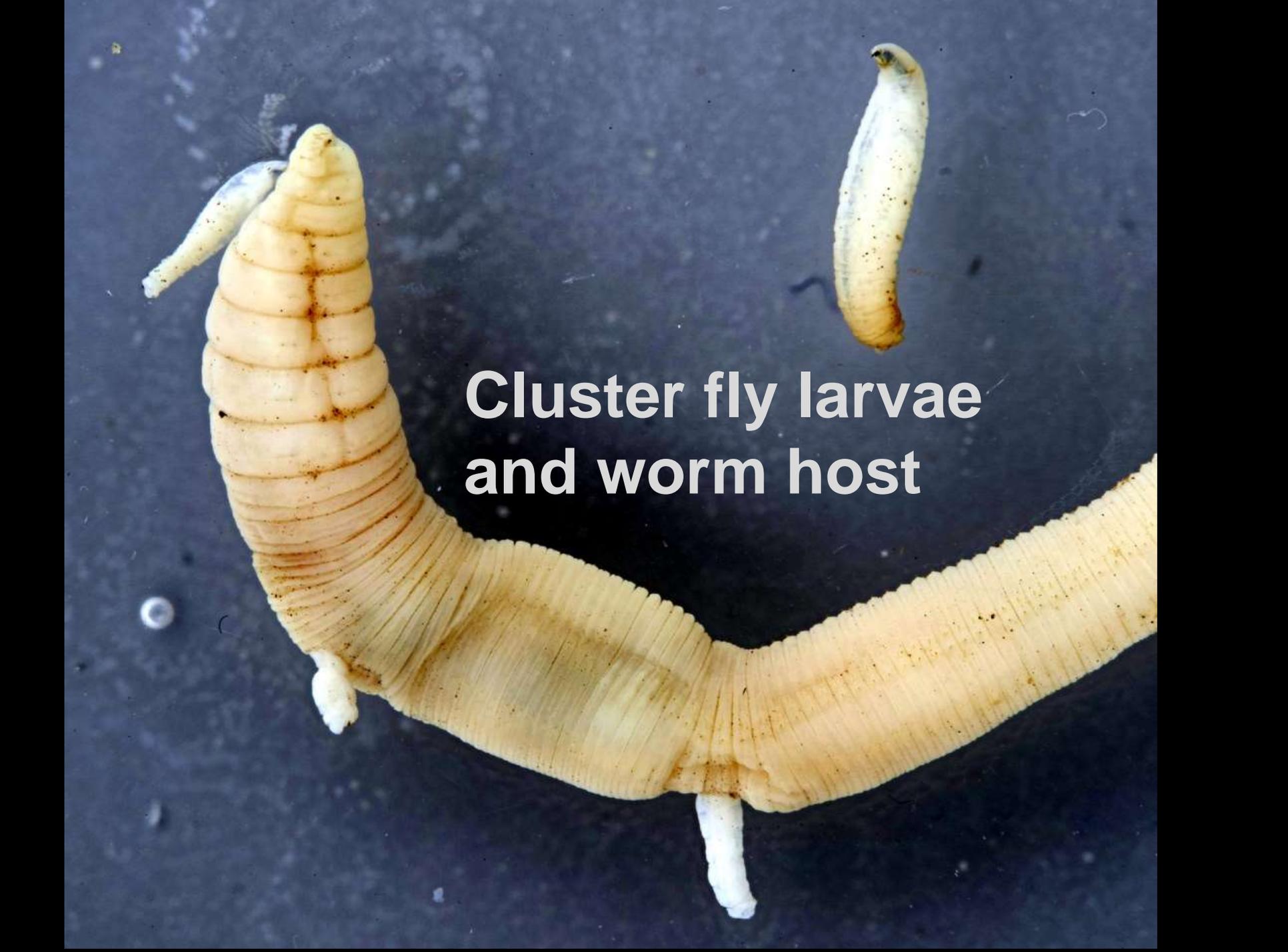


Cluster flies are parasites of earthworms – they are not ‘filth flies’

Cluster fly searching for a site to lay eggs



5369449

A photograph showing a large, segmented, yellowish worm host and several smaller cluster fly larvae on a dark background. The worm is the central focus, with a distinct head region and a long, segmented body. Two smaller larvae are attached to the worm's body, one near the head and one further down. Another single larva is shown separately in the upper right. The background is dark and textured.

**Cluster fly larvae
and worm host**

There are three common species of cluster flies found within homes in Colorado

- *Pollenia pediculata*
- *Pollenia rudis*
- *Pollenia angustigena*



Scenario for Cluster Fly Invasion of a Building



- Flies move to sunlit vertical surfaces 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
- Pyrethroid insecticides can be applied to exterior around openings
- Insecticide dusts can be blown 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





Little house fly – and some closely related flies – develop primarily on animal waste. Some are particularly noted to be associated with poultry waste.



**Little
house fly**

Fannia canicularis



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

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





This one
was on the
inside of my
front door
on Sunday



Ceroxys latiusculus – A picture-winged fly that commonly enters buildings in autumn



Larvae develop in plants of the genus *Senecio*

“Small Flies”



Humpbacked flies



Vinegar flies/Small fruit flies



Fungus gnats



Moth flies



Vinegar/Small Fruit Flies

Diptera: Drosophilidae

Small fruit flies
attracted to an
overripe peach



Small fruit fly larvae developing in overripe peach



TIME FLIES LIKE AN
ARROW; FRUIT
FLIES LIKE A
BANANA.



Groucho Marx
American Comedian
1890 - 1977

QUOTEHD.COM

Postscript: Unfortunately fact checking indicates that Groucho Marx *was not the first person to use this phrase* – and may never have said it.



Developing small fruit flies/vinegar flies in an overripe banana



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

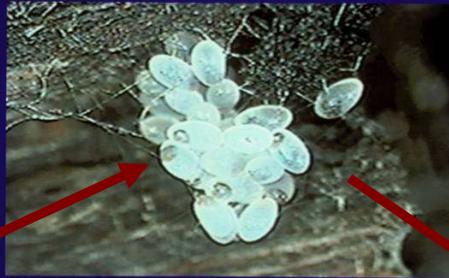
Diptera: Mycetophilidae,

Adult fungus gnats are small with a gnat-like body form



They are weak fliers that make short, skipping flights

Adult



Eggs



Larvae

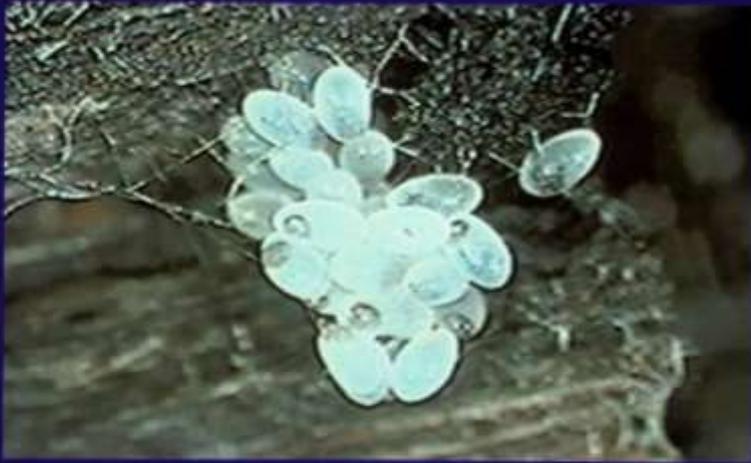
Pupae





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.**



5422723

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 (*Stratiolaelaps scimitus*)
- 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/plumbing.**



They are also called filter flies, as they can become very abundant in water filter beds.





**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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Control of “Drain Flies”

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Humpbacked flies
aka drain flies,
phorid flies

Diptera: Phoridae

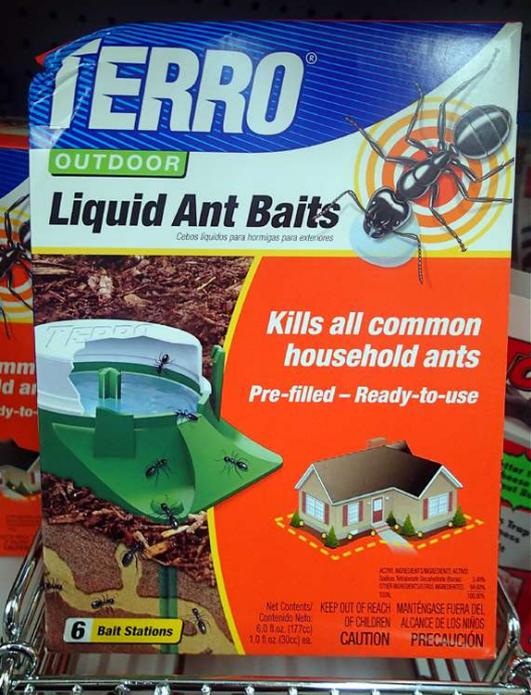
Small dung flies
Sphaerocerid flies

Diptera:
Sphaeroceridae



Indoor Flies



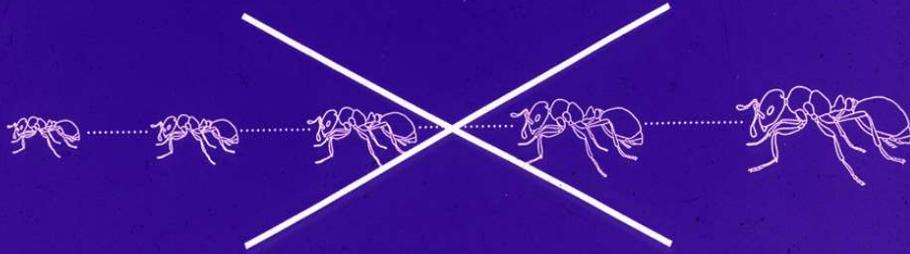


Indoor Ants



Some fundamentals first:

- **Metamorphosis pattern**
- **Castes**
 - **Winged vs. non-winged forms**
- **Size variations**
- **The pedicel (one lump - or two?)**



Complete metamorphosis

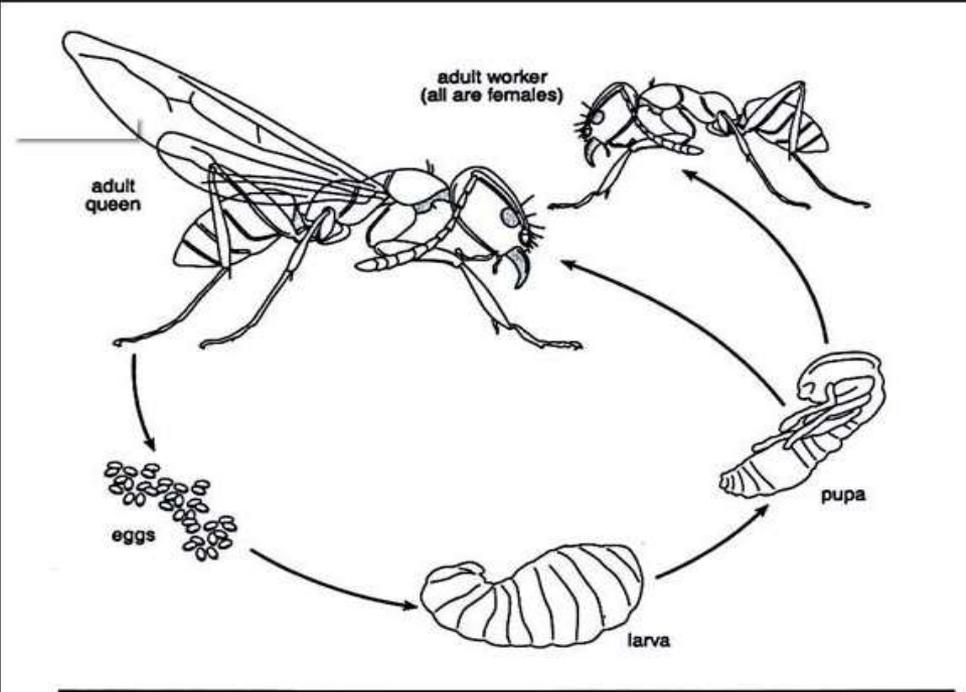


Figure 3. Life cycle of the ant.



Ant Larvae



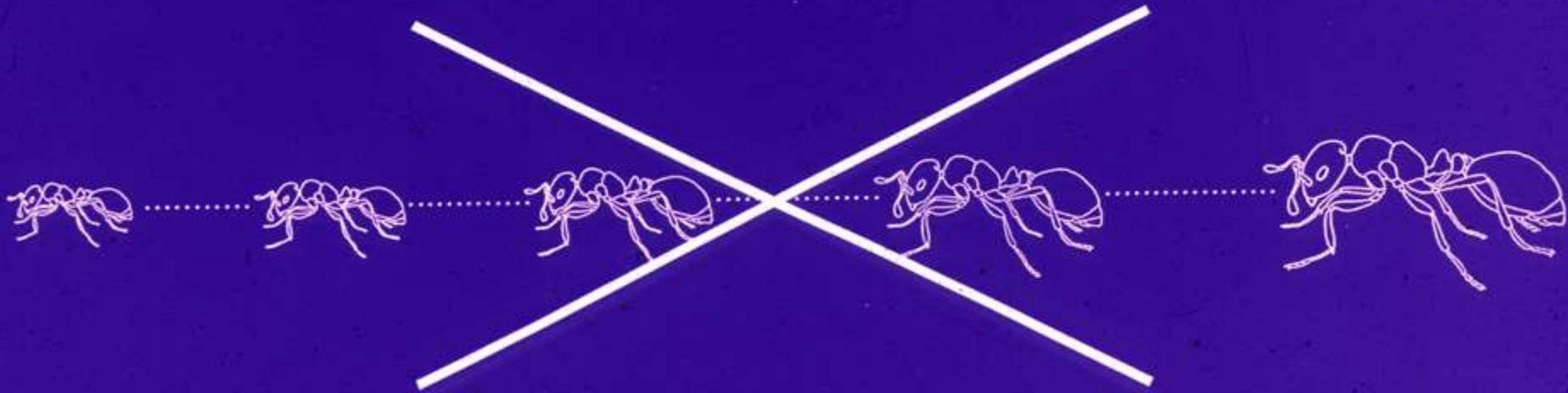
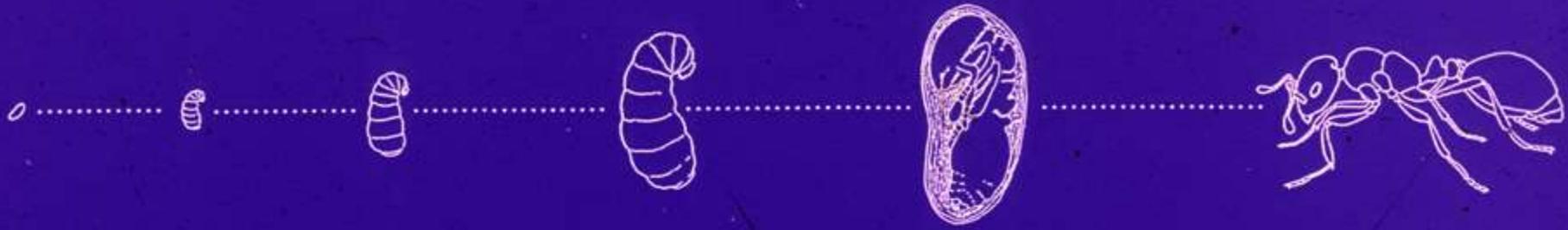
Ant Pupae



UGA1148023

Ant larvae and pupae (within cocoons) tended by workers





A Bug's Life – The Worst Representation
Involving Ants **Hollywood has ever produced**



HYMENOPTERA

Ant Caste System



queen



male



worker



Pharaoh Ants

Van Waters & Rogers
1981 division of Univar

TEXAS



2 MM GRID



Queen

A fully fertile female

Often – but not always - one per colony

Have wings initially (for mating flight)

Remove wings after mating





Field ant workers



Field Ants – Winged Reproductive Forms

Top: Male

Bottom: Female



Carpenter ant worker





**Winged
males and
females**





Winged forms (male, queens) emerge episodically in large masses for mating flights.





Hilltopping: Winged males and females (from many colonies) aggregate at prominent points in the landscape.

Soon after mating the males die and the female ant seeks a safe location to start a new colony.

The wings are shed and the wing muscles help nourish her during colony establishment.



Winged reproductive males and females meet over prominent points in the landscape



5490385

Mating balls of ants
under that tree

Harvester ants and the 'hilltopping' phenomenon





Harvester ants and the 'hilltopping' phenomenon

1801 California Ave., Denver
(Century Link sign at top)



Solution? Build a bigger skyscraper and the ants will go there.

In abrupt episodes, workers push the winged stages from the colony



After the nuptial flight the males die and the females each try to establish a new colony

Carpenter ant queen without wings (dealate)

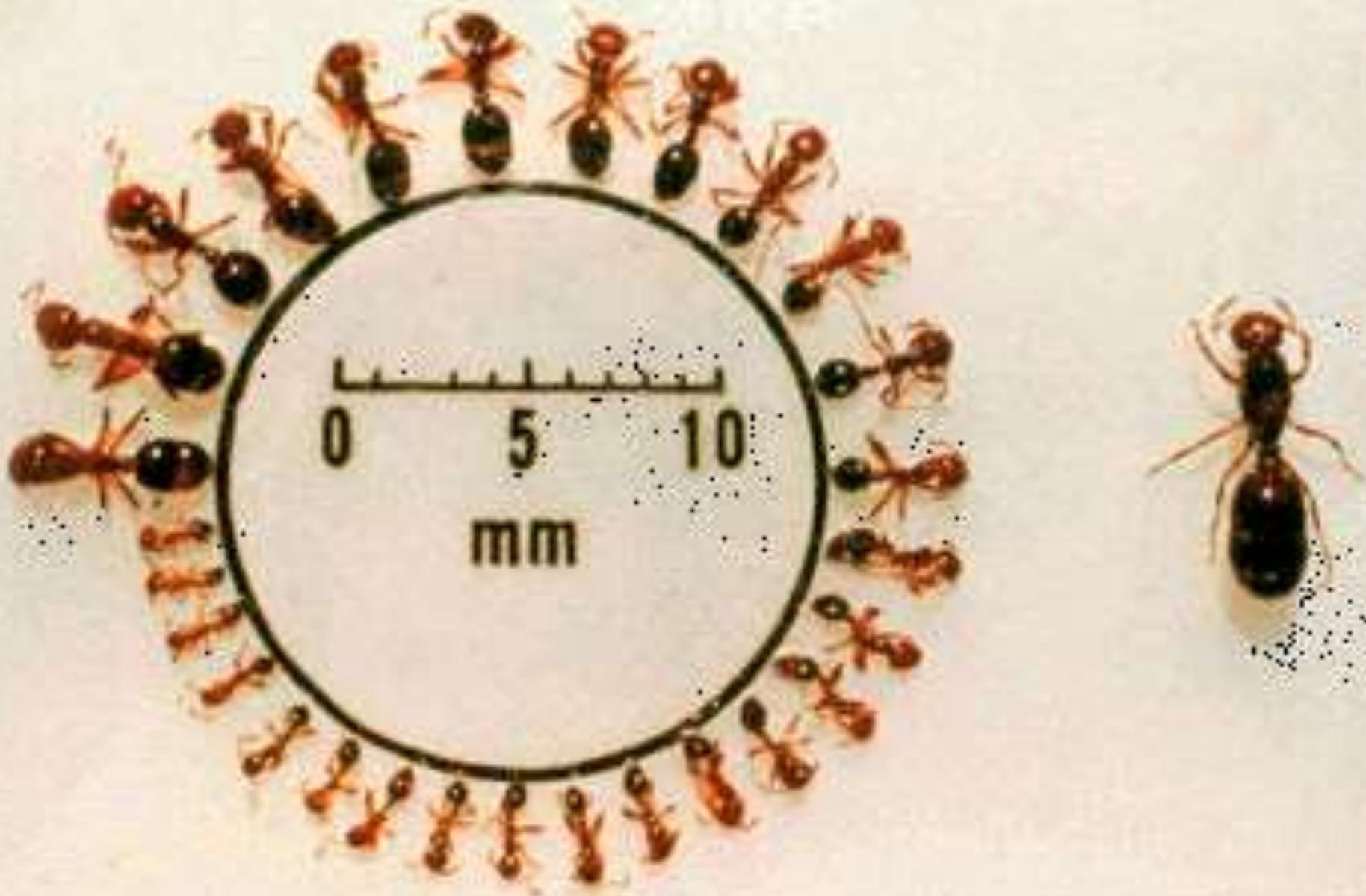




Aluminum cast
of a harvester
ant nest

Plaster cast of a large *P. badius* harvester ant nest

Red imported fire ant – a polymorphic species



**Pavement ant –
a monomorphic
species**



Ants and honeydew



Honeydew production



Ants and Aphids

A Mutualistic Relationship



- Aphids provide food – *honeydew*
- Ants provide protection





Some ant (females) have a functional stinger and (most) can inject some type of venom

Ants do not have a barbed stinger





Ants in the subfamily Formicinae do not sting

Some will use **formic acid** or other chemicals in defense



From the Ammonite production Smalltalk Diaries

Ants that may occur in a building in Colorado include:

- Field ants (*Formica* spp.)
- Carpenter ants (*Camponotus* spp.)
- Odorous house ant (*Tapinoma sessile*)
- Pavement ant (*Tetramorium immigrans*)
- Pharaoh ant (*Monomorium pharaonis*)

Field Ants – *Formica* spp.



A common group of ants outdoors – A temporary ant found in homes in early spring

Thorax noticeably indented



One hump (node) on pedicel



**Field ants –
aka “thatcher
ants”**





UGA1476017

Field ants are predators of other soft-bodied invertebrates

These ants will also collect honeydew to supplement their diet



UGA5255025



**Field ants collecting
aphid honeydew**

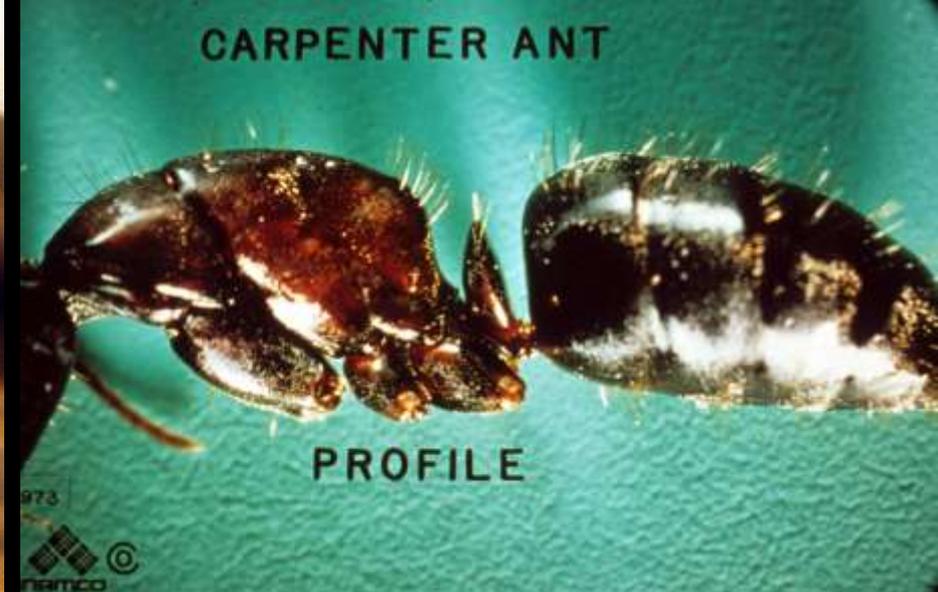
**Field ants collecting
sugary secretion from
peony buds**



Harbingers of Spring

Robin (left); Field ants temporarily forage in homes (below)





Carpenter ants



Thorax smoothly humped (no indentation)





One hump (node) on pedicel



Most species of carpenter ants nest in wood.



They *do not* eat wood.



UGA5006035

Carpenter ant tunneling

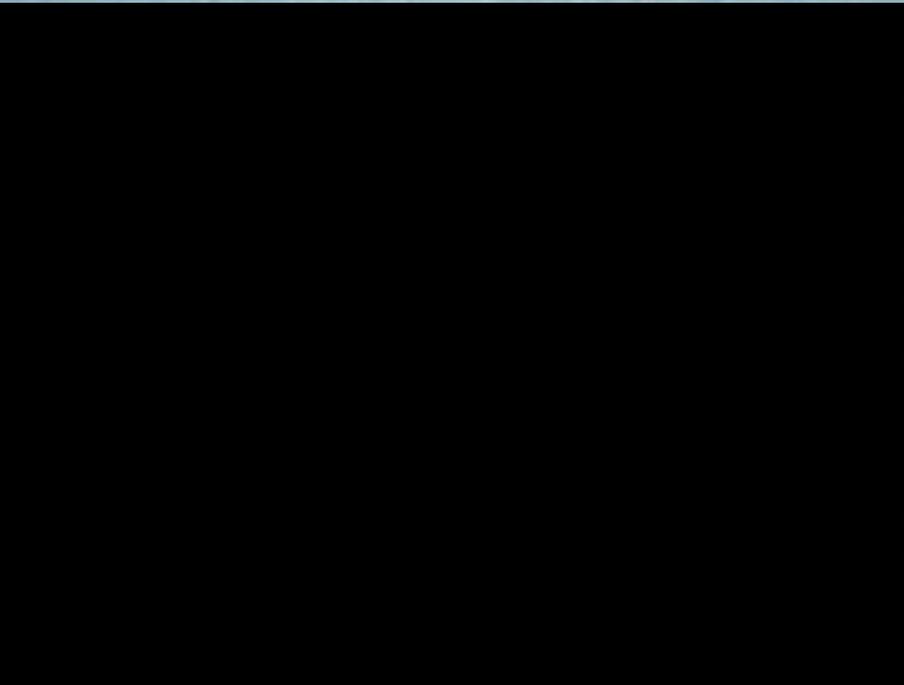
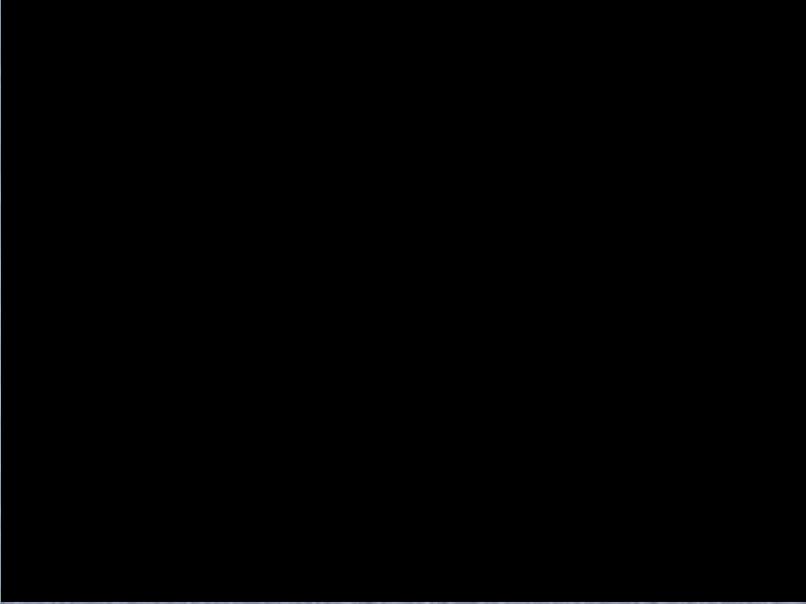


Expelled sawdust at colony openings



Debris expelled from carpenter ant nest





Carpenter Ants

- **Nest in wood**
 - Produce clean, debris-free galleries
- **May produce satellite colonies in structures**
- **Feed heavily on honeydew**
 - Live, dead insects are other common foods
- **Are primarily night active**



**Odorous
house ant**



Odorous house ant

- **Medium sized (1/8-1/10 inch/2.4-3.3 mm)**
 - Monomorphic
- **One node on pedicel, but flattened and concealed**

Odorous house ants heavily utilize honeydew



Mulches provide favorable nest sites for odorous house ants





Mulch and vegetation covering the foundation may also cover up ant activity around your home.



Myrmicine Ants

- Possess stinger
- Pedicel is two-humped (two nodes)
- Examples
 - Pavement ant
 - Pharaoh ant
 - Fire ants
 - Harvester ants

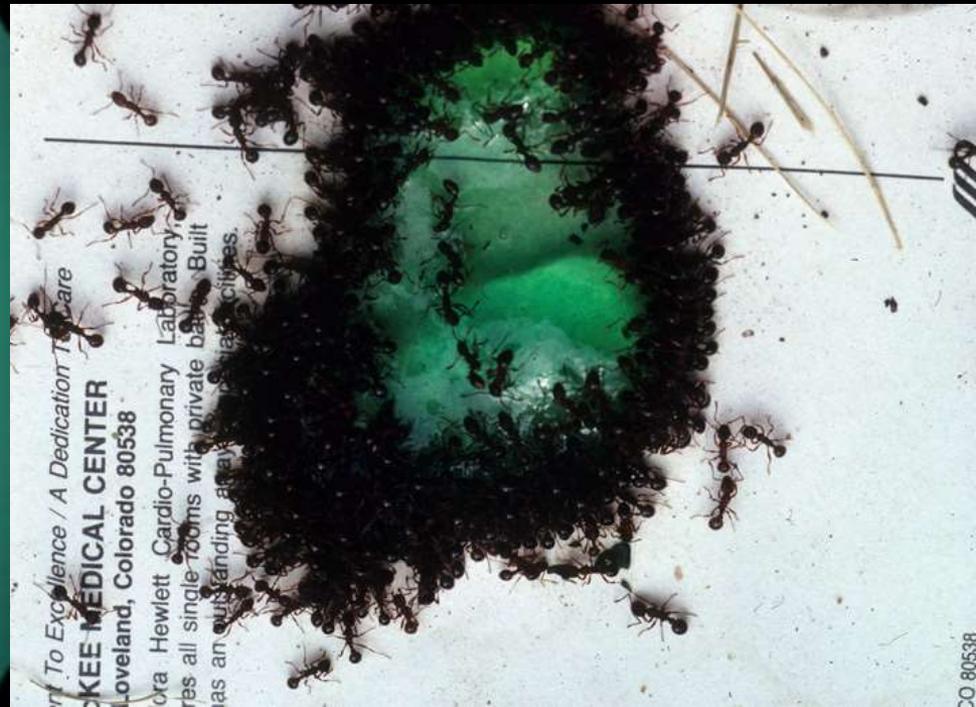
Clusters of mounds near water source



Pavement Ant worker head & antennae



Van Waters & Rogers
1984 division of Univar



...nt To Excellence / A Dedication To Care

WEEK MEDICAL CENTER

Loveland, Colorado 80538

...ora Hewlett Cardio-Pulmonary Laboratory,
...res all single-rooms with private baths. Built
...as an outstanding area for medical facilities.

CO 80538

**Pavement ant –
a monomorphic
species**



Two humps (nodes) on pedicel



Grooves on head



**Nests are shallow and usually under rocks,
pavement or similar cover**





Flickers feed heavily on pavement ants





**Pavement ant
raids are
common**

Raiding events by pavement ants can be commonly observed, as colonies define boundaries



Video by Eunice Bembissa,
Spring 2017

Sweets, oils, and protein-rich foods may alternately be favored by pavement ants



5393399

Interesting oddity!



**Sausage shrine
produced by ants
(pavement ants?)**

Bizarre Video Shows Ants Performing A Strange Ritual Around A Dead Bee

18.1K
SHARES



Share on Facebook

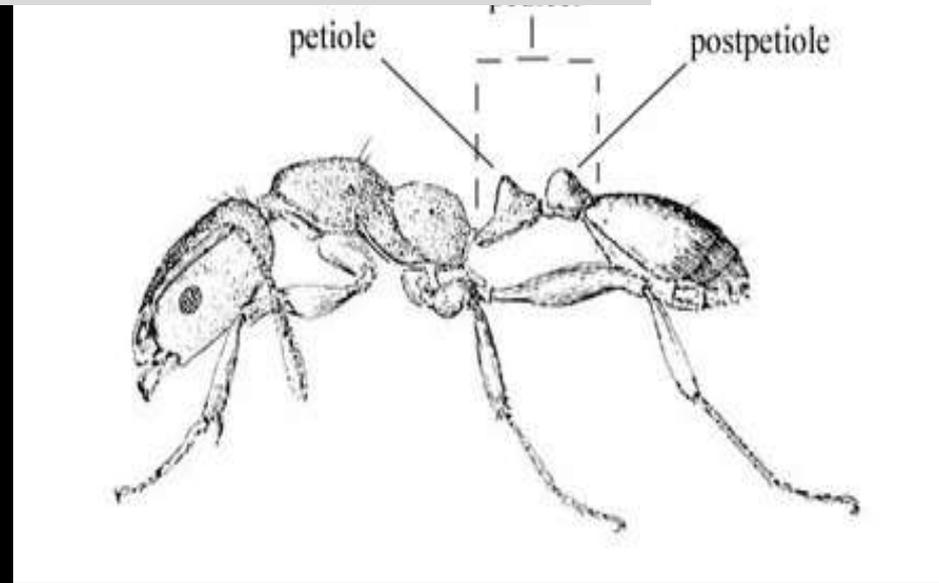


Share on Twitter

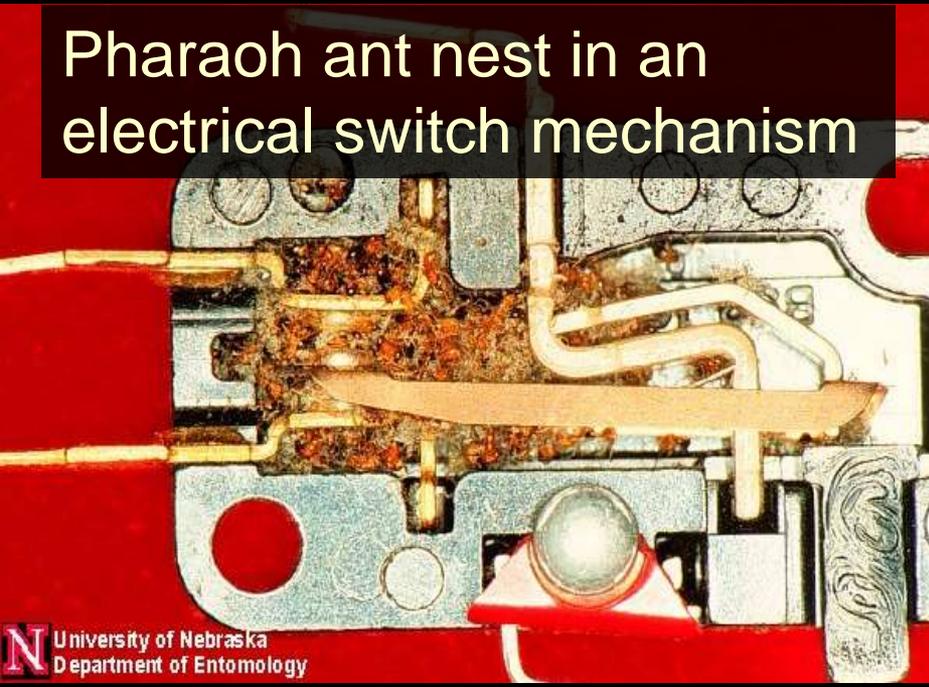


This was not a funeral honoring the bee. **The ants were surrounding it with available debris to hide it – so they could cut it up among themselves and bring it back to their nest for food!**

Pharaoh ant – the smallest of the household ants



Pharaoh ant nest in an electrical switch mechanism



Pharaoh ants are extremely small (2 mm)

Nests are small, often located in small cavities, and often include scattered secondary (satellite) nests

Control of Ants in the Home

- **Eliminate food resources**
- **Eliminate water resources**
- **Bait to reduce colony size**
- **Seal/caulk entry points**
- **Sprays?**

Eliminate Sources of Water





Eliminate Alternate Sources of Food





Pavement ants
working within my
home over the
past few weeks

Food source:
Honeydew produced
by soft scales and
mealybugs on my
houseplants



Baiting for Ants



Fundamentals of Ant Baiting

- **Match bait to feeding habits of target ant species**
- **Use slow-acting toxicant**
- **Remove alternate food sources**
- **Place bait near foragers**
- **Maintain bait quality**
- **Replenish baits as needed**

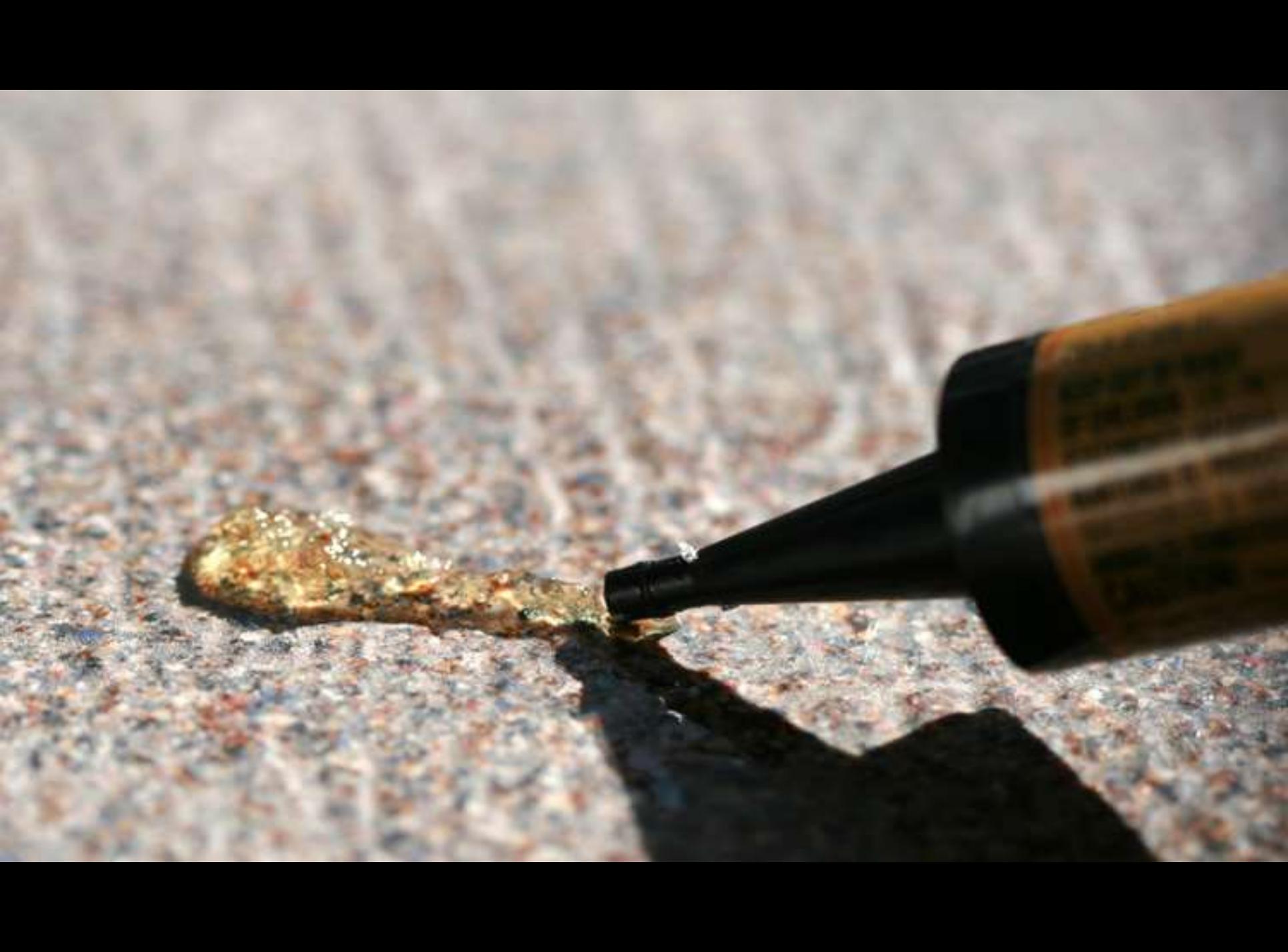
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Other Food Preferences

- **Oily materials**
 - Pharaoh ant
 - Pavement ant (often)
- **Sweet materials**
 - Field ant
 - Carpenter ants
 - Odorous house ants
 - Pavement ants (sometimes)





Fundamentals of Ant Baiting

- Match bait to feeding habits of target ant species
- **Use slow-acting toxicant**
 - Boric acid
 - Hydramethylnon
 - Indoxcarb
 - Fipronil
- Remove alternate food sources
- Place bait near foragers
- Maintain bait quality
- Replenish baits as needed



ACTIVE INGREDIENTS/INGREDIENTE ACTIVO:
 Sodium Tetraborate Decahydrate (Borax) 5.40%
 OTHER INGREDIENTS/OTROS INGREDIENTES: 94.60%
 TOTAL 100.00%

TERRO[®]
OUTDOOR
Liquid Ant Baits
Cebos líquidos para hormigas para exteriores

Kills all common household ants
Pre-filled - Ready-to-use

6 Bait Stations

Net Contents/
 Contenido Neto:
 6.0 fl.oz. (177cc)
 1.0 fl.oz. (30cc) ea.

KEEP OUT OF REACH
 OF CHILDREN
CAUTION

MANTÉNGASE FUERA DEL
 ALCANCE DE LOS NIÑOS
PRECAUCIÓN

ACTIVE INGREDIENTS/INGREDIENTE ACTIVO:	5.40%
Sodium Tetraborate Decahydrate (Borax)	5.40%
OTHER INGREDIENTS/OTROS INGREDIENTES:	94.60%
TOTAL	100.00%

Borax or Boric Acid based baits

Borates used for wood protection



Boric acid used for ant and cockroach control

Primary uses of boron-based insecticides



www.thewhimsicalmusingsofsusan.com



Hydramethylnon
– an insect growth
regulator type of
insecticide



DO NOT ALLOW CHILDREN OR PETS TO PLAY
WITH THE BAIT STATIONS.

CAUTION: SEE PRECAUTIONARY
STATEMENTS ON SIDE PANEL

ACTIVE INGREDIENT: Hydramethylnon[†] 1.0%

OTHER INGREDIENTS: 99.0%

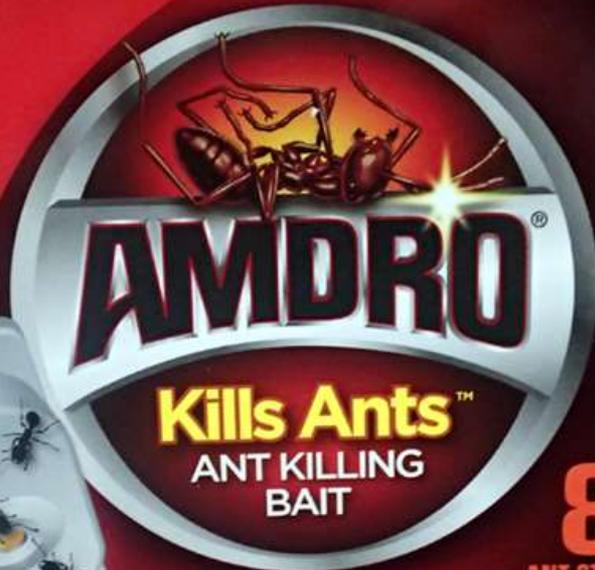
[†]CAS No. 67485-29-4

NO PERMITA QUE NIÑOS NI MASCOTAS
JUEGUEN CON LAS ESTACIONES DE CEBDO

A hydramethylnon product used on ants outdoors

Destroys Entire Colonies!^{*}
Guaranteed to Work!^{**}

- 1 Kills Ants Now^{***}
- 2 Ants Carry Bait Back to the Colony to Kill the Queen
- 3 Helps Keep Ants from Coming Back



Kills Ants™
ANT KILLING
BAIT

8

ANT STAKES
ESTACAS
PARA HORMIGAS

INDOOR
& OUTDOOR



^{*}DESTRUYE COLONIAS ENTERAS
^{**}GARANTIZADO QUE FUNCIONA
^{***}ELIMINA LAS HORMIGAS AHORA

ACTIVE INGREDIENT:
Hydramethylnon (CAS #67485-29-4) 1.0%
OTHER INGREDIENTS 99.0%

NET WT 0.16 OZ EA
TOTAL NET WT 1.28 OZ

KEEP OUT OF REACH OF CHILDREN
CAUTION (See back panel for additional
Precautionary Statements)
MANTENER FUERA DEL ALCANCE DE LOS NIÑOS
PRECAUCION (Verse el panel posterior para obtener
instrucciones de precaución adicionales)

EASY, READY TO USE, GUARANTEED.
STARTS WORKING IMMEDIATELY.

KILLS ANTS
ANT KILLING BAIT
INDOOR & OUTDOOR

ERAS
IONA
AHORA

ACTIVE INGREDIENT:
Hydramethylnon (CAS #67485-29-4) 1.0%
OTHER INGREDIENTS:..... 99.0%

NET
TOTAL

COMBAT

KILLS ANTS & THE COLONY

SOURCE KILL MAX^{A2} ANT PARA HORMIGAS

MATA HORMIGAS Y LA COLONIA

KEEP OUT OF REACH OF CHILDREN. USE ONLY IN AREAS NOT EASILY ACCESSIBLE TO CHILDREN AND PETS.

CAUTION: SEE PRECAUTIONARY STATEMENTS ON SIDE PANEL.

ACTIVE INGREDIENT: Fipronil[†] 0.001%
OTHER INGREDIENTS: 99.999%
CAS No. 120068-37-3

USAR SÓLO EN ÁREAS INACcesIBLES A NIÑOS Y MASCOTAS. MANTENGA FUERA DEL ALCANCE DE NIÑOS.

PRECAUCIÓN: VEA LAS DECLARACIONES PRESENTADAS EN EL PANEL DEL LADO.



CONTAINS: 1 SYRINGE
TOTAL NET WT 0.95 OZ (27g)

PRECAUTIONARY STATEMENTS: HAZARDS TO HUMANS AND DOMESTIC ANIMALS. CAUTION: Harmful if absorbed through skin. Avoid contact with eyes, skin or clothing. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. FIRST AID: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash the product container or label with you when calling a poison control center or doctor or going for treatment. **COMBAT** MAX is not for use in areas accessible to children and pets. Do not reuse or refill this container. After use, recycle, if available. If recycling is not available, place in trash. If partially full: Call your local solid waste agency for disposal instructions. Never place unused product down any drain. **PRECAUCIÓN:** Evitar el contacto con ojos, piel, y ropa. Evitar las manos antes de comer, beber, mascar goma, usar tabaco o usar el baño. **ELIMINACIÓN:** Si el producto está vacio: Evitar que se le pueda volver a utilizar. Si queda a usar se cubra a tener más de 2 años desde la fecha de fabricación. **ALMACENAMIENTO:** Guardar en un lugar fresco y seco, fuera del alcance de los niños. **ELIMINACIÓN:** Si el producto está vacio: Evitar que se le pueda volver a utilizar. Si queda a usar se cubra a tener más de 2 años desde la fecha de fabricación. **LINEA DE AYUDA COMBAT:** 1-800-4-A-ANTS

PRECAUTIONARY STATEMENTS: HAZARDS TO HUMANS AND DOMESTIC ANIMALS. CAUTION: Harmful if absorbed through skin. Avoid contact with eyes, skin or clothing. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. FIRST AID: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash the product container or label with you when calling a poison control center or doctor or going for treatment. **COMBAT** MAX is not for use in areas accessible to children and pets. Do not reuse or refill this container. After use, recycle, if available. If recycling is not available, place in trash. If partially full: Call your local solid waste agency for disposal instructions. Never place unused product down any drain. **PRECAUCIÓN:** Evitar el contacto con ojos, piel, y ropa. Evitar las manos antes de comer, beber, mascar goma, usar tabaco o usar el baño. **ELIMINACIÓN:** Si el producto está vacio: Evitar que se le pueda volver a utilizar. Si queda a usar se cubra a tener más de 2 años desde la fecha de fabricación. **ALMACENAMIENTO:** Guardar en un lugar fresco y seco, fuera del alcance de los niños. **ELIMINACIÓN:** Si el producto está vacio: Evitar que se le pueda volver a utilizar. Si queda a usar se cubra a tener más de 2 años desde la fecha de fabricación. **LINEA DE AYUDA COMBAT:** 1-800-4-A-ANTS

TO CHILDREN AND PETS.

CAUTION: SEE PRECAUTIONARY STATEMENTS ON SIDE PANEL

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[†]CAS No. 120068-37-3

USAR SÓLO EN ÁREAS INACcesIBLES A NIÑOS Y MASCOTAS.

Fipronil

Carpenter Ant Baits

- Special baits are designed for these type of ants
 - Must be liquid or moist gel
 - Sugar based



Fundamentals of Ant Baiting

- Match bait to feeding habits of target ant species
- Use slow-acting toxicant
- **Remove alternate food sources**
- Place bait near foragers
- Maintain bait quality
- Replenish baits as needed

Note: Once you have removed alternate food/water sources and set out the baits – leave the ants alone.

You want them to visit the bait undisturbed – that is the point.



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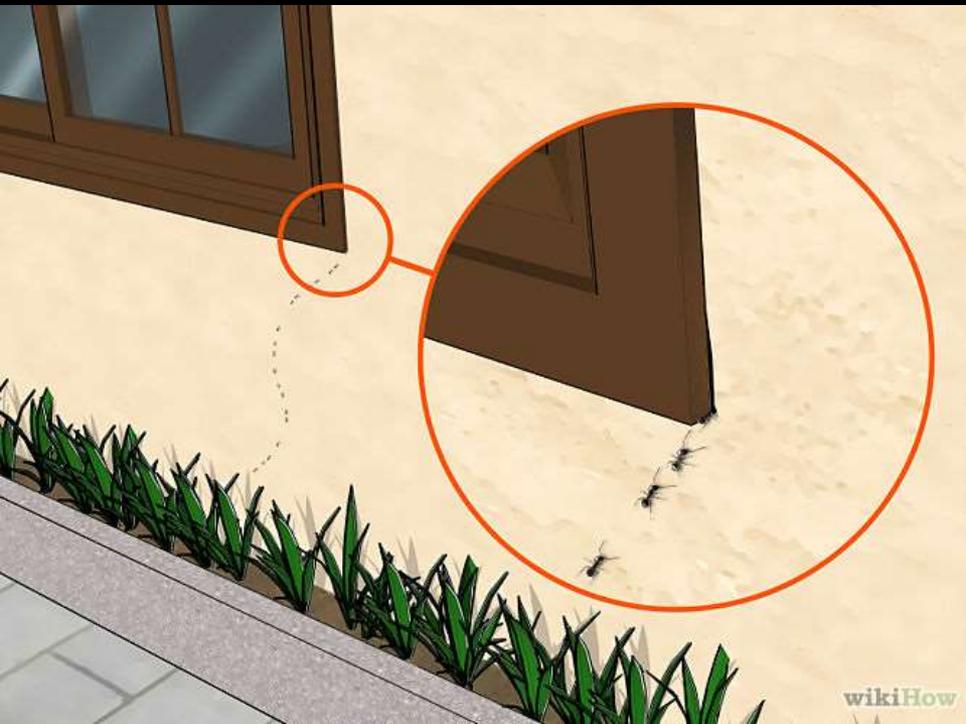
Boric acid can be used as a *tracking powder*

Boric acid is picked up and returned to the colony – similar effects of baiting.





Eliminate entry points used by ants



Use multiple approaches to eliminate ants from a home





**Effectiveness of sprays indoors for ant control?
Mostly a supplement to other primary methods.**

Control of Ants in the Home

- **Eliminate food resources**
- **Eliminate water resources**
- **Bait to reduce colony size**
- **Seal/caulk entry points**
- **Sprays?**

Unrelated End Note

Moth (filter) flies are flies,
but they look like tiny moths



The multiplume moth is a moth
that doesn't look like any other
kind of moth



Multiplume moth

Alucita montana



- A fairly common nuisance invader of homes in upper elevation, forested sites of the state.
- Larvae develop as a leafminer, feeding on snowberry

Questions?



whitney.cranshaw@colostate.edu

This presentation will be posted at the Colorado State Insect Information Website

- **Housed at** Department of Agricultural Biology
- **Within** “Entomology”
- **“Insect Information”**
 - **Extension presentations are posted at the bottom of the page, most recent at end**

Department • People • Undergraduate • Graduate • Alumni & Friends
Weed Science

About 200 fact sheets on Colorado "Bugs" linked here

Insect Information

All materials needed in another accessible format can be made available upon request.

Arthropods of Colorado Fact Sheets

This is a listing of about 200 downloadable fact sheets related to insects and other "bugs" found in Colorado. It contains fact sheets that are written for the Colorado Arthropods of Interest series and the Extension fact sheets that are related to insects.



Miscellaneous Insect Information

This contains a variety of downloadable fact sheets and pamphlets on diverse miscellaneous subjects, from "Bug Mugs" and "Life in a Colorado Water Garden" to "Mystery Bites and Itches" and "Commercially Available Sources of Biological Control Organisms: Sources and Uses in Colorado."

Resources

Some Entomology Hot Links:

- Colorado Hemp Insect Website
- Western Colorado Entomology Website
- IPM Images/Bugwood (Crashaw)
- IPM Images/Bugwood (Pears)
- Entomology Resources List
- Honey Bee Swarm Hotlines



Top of the Colorado State Insect Information Website

Bottom of the Website page

Hemp Insect Information

This links directly to the Hemp Insect Website, which includes information being developed to better recognize and manage insects associated with Industrial hemp.



Master Gardener Information

This includes the handouts and PowerPoint presentations updated annually at the end of the winter/spring training program.

- Handouts
- PowerPoint Presentations Used in 2018

This presentation will be found here

Recent Extension Presentations

This is a listing that provides the PowerPoint presentations (as PDF) of most Extension entomology programs conducted during the past 12 months.

PowerPoint Presentations/Webinars

