Roaches and Rodents and Flies, Oh My!

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TEXAS A&M AGRILIFE EXTENSION

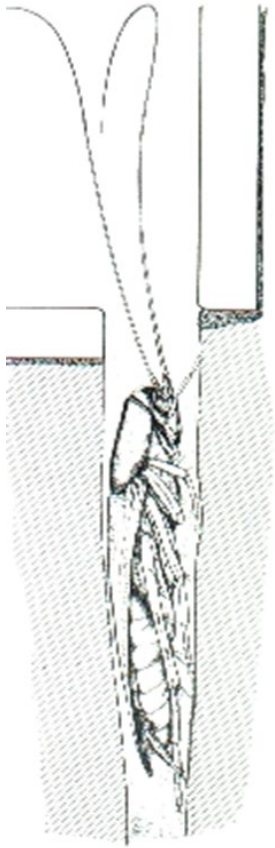
GULF SOUTH VECTOR
Vector Educational Center for Training, Outreach & Resources

Microbiolgy and Pest Control

- Cockroaches
- Flies
- Mice
- Rodents
- Squirrels

Campylobacter	E. Coli	Hepatitis
Listeria	Salmonella	Shigella
Endemic typhus/Murine Typhus	Leptospirosis	Plaque

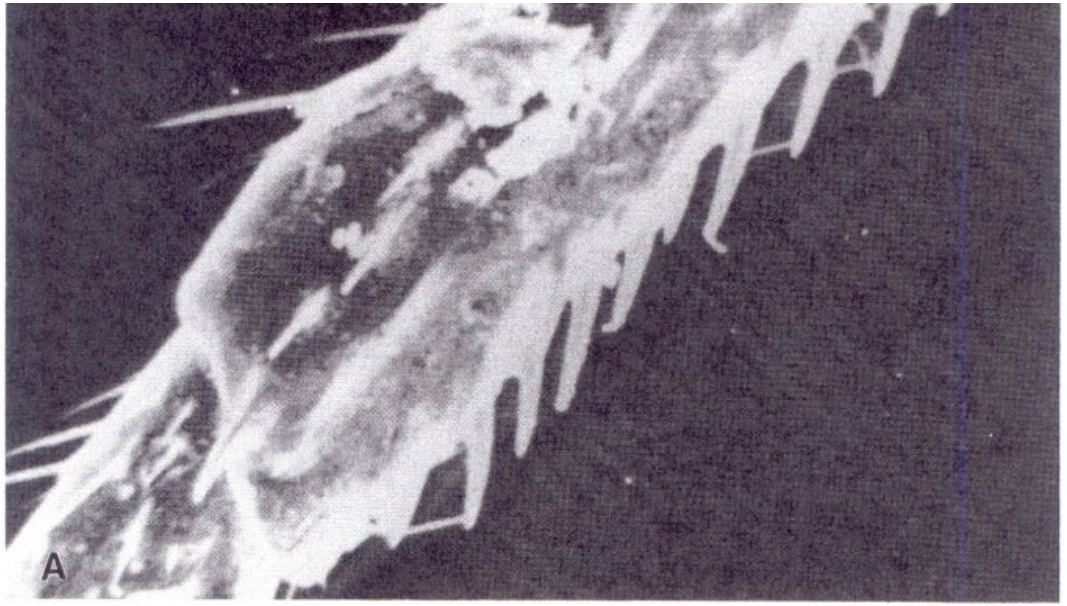
Behavioral and Physiological Traits



- Avoidance of light and air movement
- Grooming
- Aggregation
- Prefer high humidity
- Cockroaches are “Crytobiotic”
  - 67% of cockroaches gathered in 4.8 mm space

Importance of cockroaches

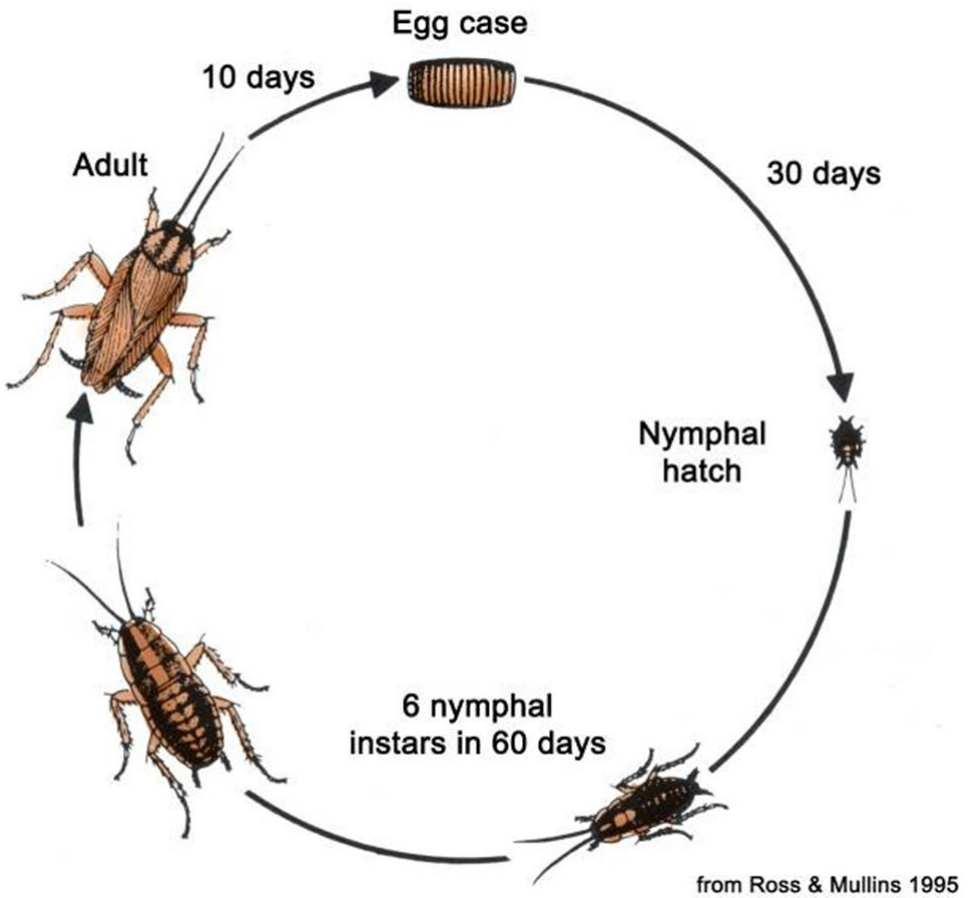
- Presence considered unsanitary
- Carry variety of pathogens including *Salmonella, E, coli and hepatitis*
- Feces and exuviae are allergenic for many children and adults
- Known Asthma and Allergy triggers
- Larger spp. provide food for rodents



German Cockroach *Blatella germanica*

German cockroach life cycle

- ½ to 5/8” long (13-16 mm)
- High reproductive rate 30-40 eggs/ootheca
- 2 months from egg to adult
  - 5-6 molts to reach adulthood
  - early instars remain close to crevices
  - feed on feces of older cockroaches (coprophagy)
- Do not fly
- Found indoors in warm, moist areas in kitchens and bathrooms



American Cockroach *Periplaneta americana*

- 1 ¾” long, reddish brown with pale edge on pronotum
- Slower reproduction
- 14 eggs/ootheca
- 9-24 months from egg to adult
- Sewers, basements, furnace rooms, attics.
- Strong flier

Turkestan Cockroach *Blatta lateralis*

Turkestan cockroach

- 1.2 inches-long
- Sexually dimorphic
  - Males reddish brown with crème-colored wing bar and incomplete ring around pronotum
  - Females blackish with crème-colored wing bar, vestigial wings
- Emerging pest, mostly SW US, competes with Oriental cockroach (top image)

Effective control measures

Caulk and seal	Caulk and seal harborages
Eliminate	Eliminate, reduce, separate water and food resources
Bait and dust	Bait and dust harborage areas identified by sticky traps
Apply	Apply residual sprays to harborages

Solving Pest Problem Takes IPM

Behavioral changes

- Cleaning up old bait, draining water out of floor machines, other places that collect moisture

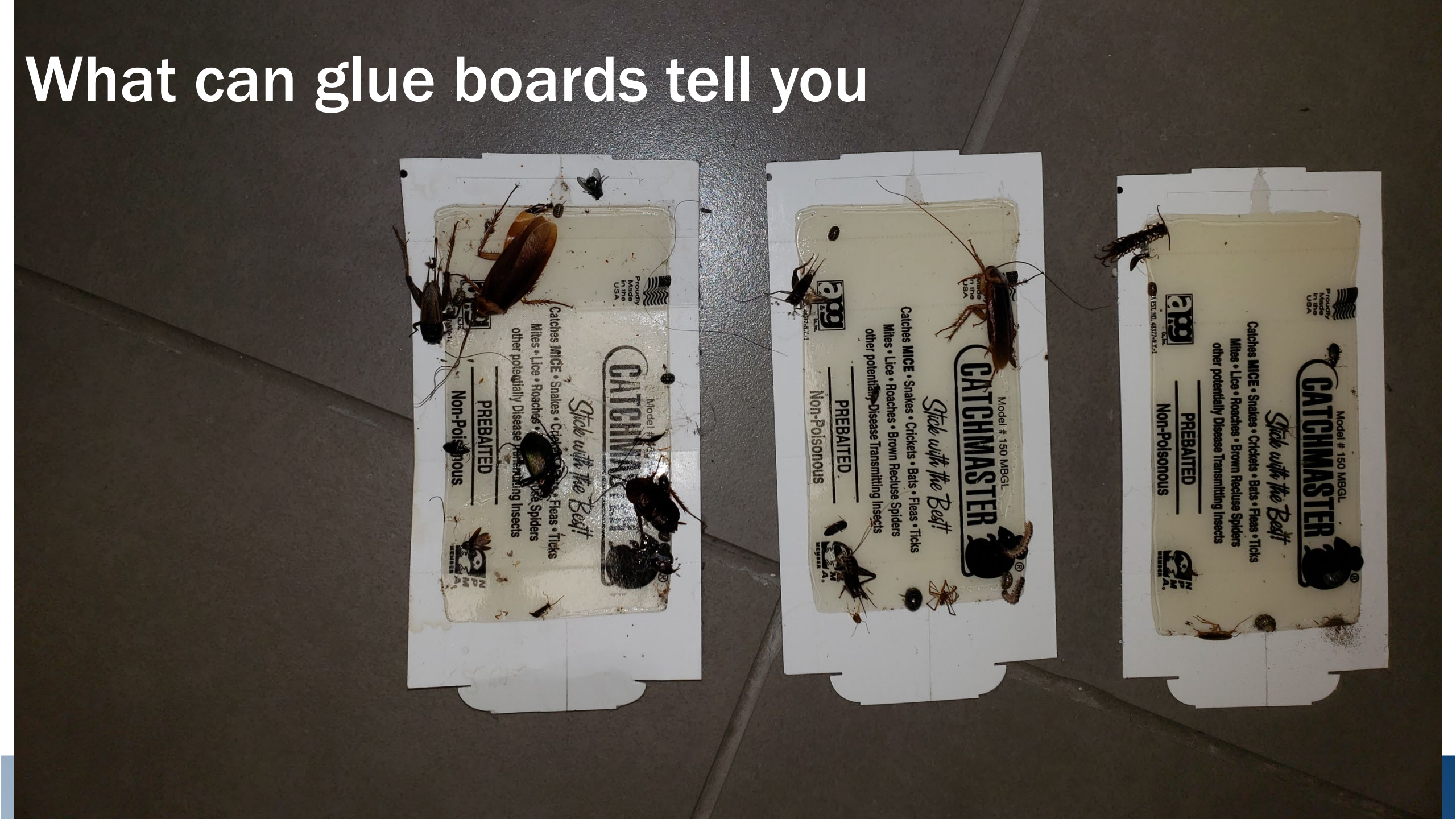
Physical changes

- Sealing up additional areas, adding door sweeps, and installing trap guards in kitchens

Treatment recommendations

- Changed bait matrix – make applications based on label
- Apply in all mechanical rooms located throughout facility

What can glue boards tell you



Monitoring

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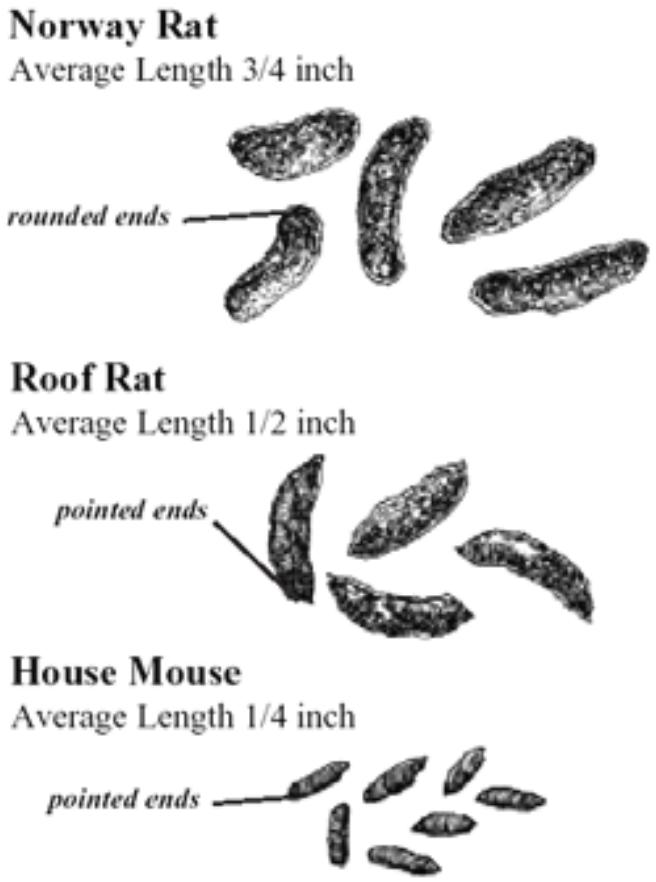
Mice & Rats

- Largest order of mammals
- 2,230 species
- 43% of all mammals
- Family Muridae, ~500 species
- Family to which commensal rats and mice occur
- “Commensal” means “to share the table”

Contamination



- Mice
  - 40-100 droppings per day
  - Thousands of microdroplets of urine per day in travels
- Rats
  - 20 to 50 droppings per day
  - Excrete about 0.5 ounce of urine per day

Rodents and Human Disease

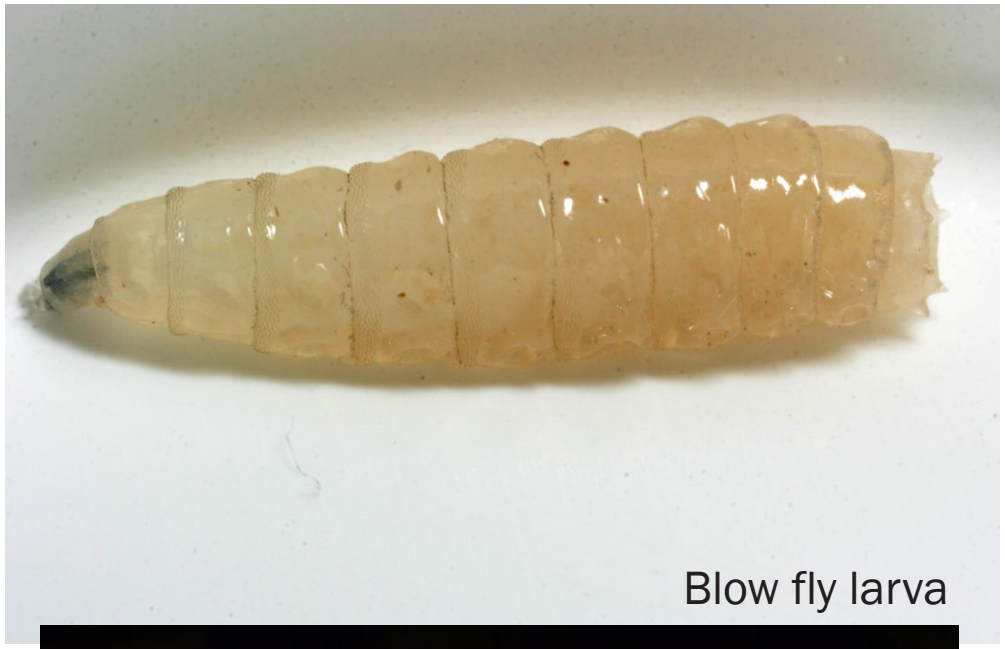
Human Disease	Pathogen	Vector
Bubonic plague	*Yersinia pestis*	Asiatic rat flea
Louse-borne relapsing fever (LBRF)	*Borrelia recurrentis*	LBRF body louse
Lyme disease	*B. burdorferi*	*Ixodes* sp.
Murine typhus	*Rickettsia typhi*	Murine typhus asiatic flea
Pediculosis-rickettsia	*R. typhi*	Body louse
Rickettsia	*R. akari*	Richekttsial poxa rodent mite
Tick-borne RF	*Borrelia sp.*	*Ornitodorus hermsi*

What are flies?

- Two-winged insects
- Complete metamorphosis
  - Larva
  - Pupa
  - Adult
- Excellent fliers
  - Easily disperse to spread pathogens

Fly larvae

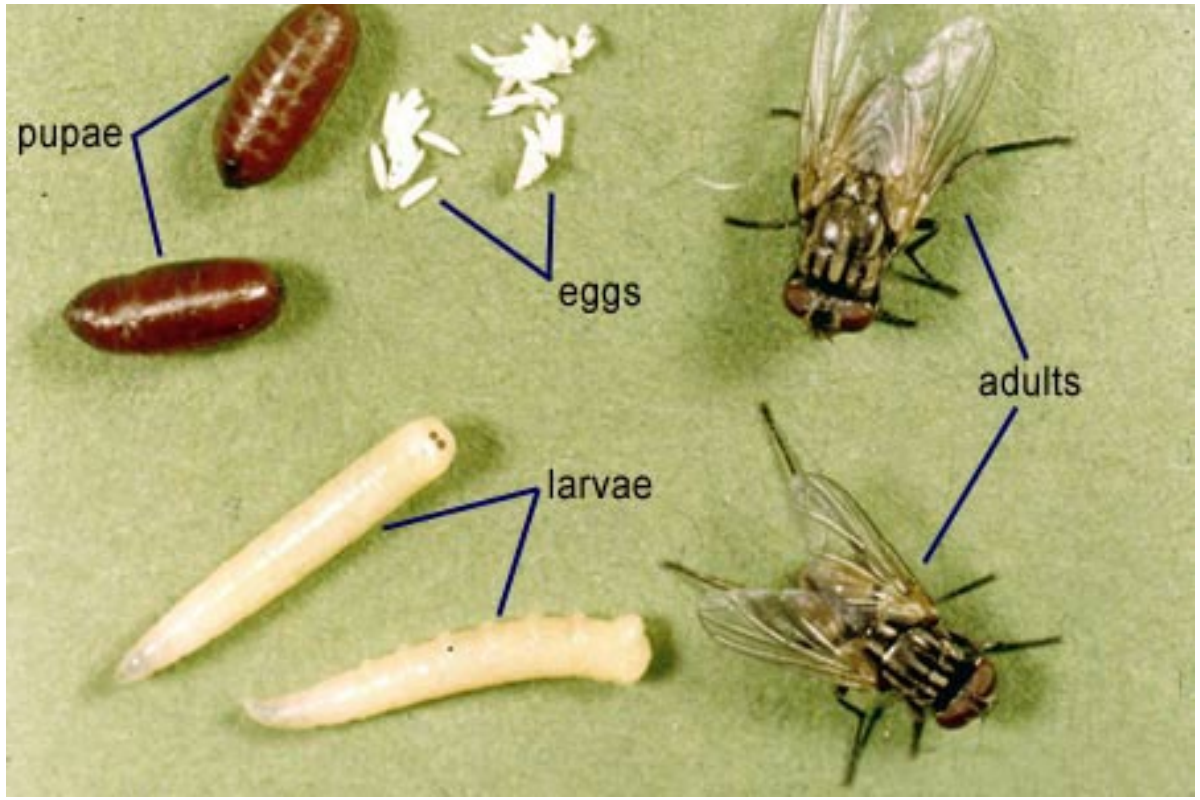
- Fly larvae legless, slender with ability to move quickly
- Most with thin exoskeleton subject to rapid dessication
- Confined to moist habitats (garbage, manure, decaying plants, soil, water, carcasses, etc.)



Blow fly larva

House fly, *Musca domestica*

- Dull gray fly, 1/8 to ¼ inch-long, four narrow black stripes on thorax, pale sides on abdomen
- 350-900 eggs per female
- Life cycle as little as 6-10 days
- Adults live 15-25 days



House fly larvae

- Legless, typical maggot shape
- Breeds in manure, garbage (dumpsters) outdoors
- 3-to-7-day development time
- Identification by spiracles at tail of body

Adult house flies

- Adults feed principally on liquid foods
- Disperse up to 20 miles (most within ½ mile)
- Continually regurgitating and defecating (fly specks)
- Active during day, but attracted to UV light traps indoors
- Adult flies indoors usually enter through doors, windows

Control options for flies and roaches

- Sanitation, sanitation, sanitation
  - Most control measures relate to changing the environment to
    - Eliminate breeding sites
    - Exclude
    - Trap
- Insecticides provide at best temporary relief, or suppression in severe outbreaks

Non-Chemical Control Tactics

- Dumpster placement
  - 50 feet recommended
- Dumpster sanitation
- Trash receptacles on nonporous surface
- Door policies
- Indoor light traps

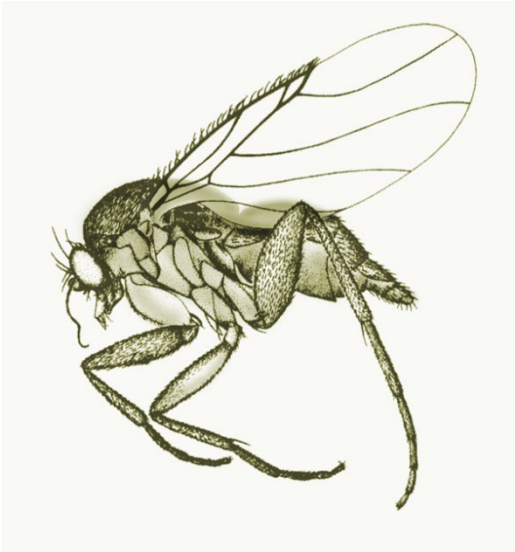
Fly trap installation

- Installation critical
  - Ideal height 4 to 6 ft
  - Near outside doors
  - Not visible from outside
- Maintenance
  - Sticky cards replaced at least monthly
  - Bulb on annual replacement schedule
  - Inspection record should be on trap

High voltage electrocuting grid traps are inappropriate for food establishments. Traps should use low-voltage shock strips and/or glue paper

Fly baits, traps and sprays

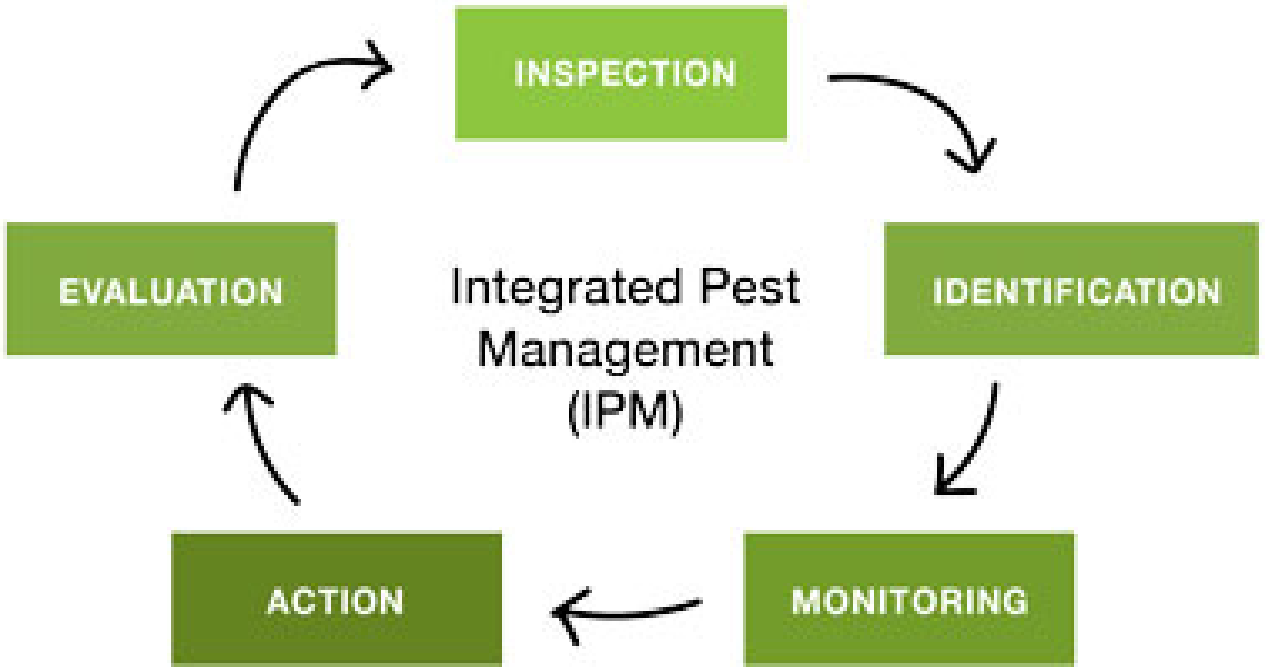
- Flying insect sprays not generally effective
- Baits for areas where source cannot be controlled (suppression)
- Baited traps and tapes provide minimal control
- Mexican water balloons?



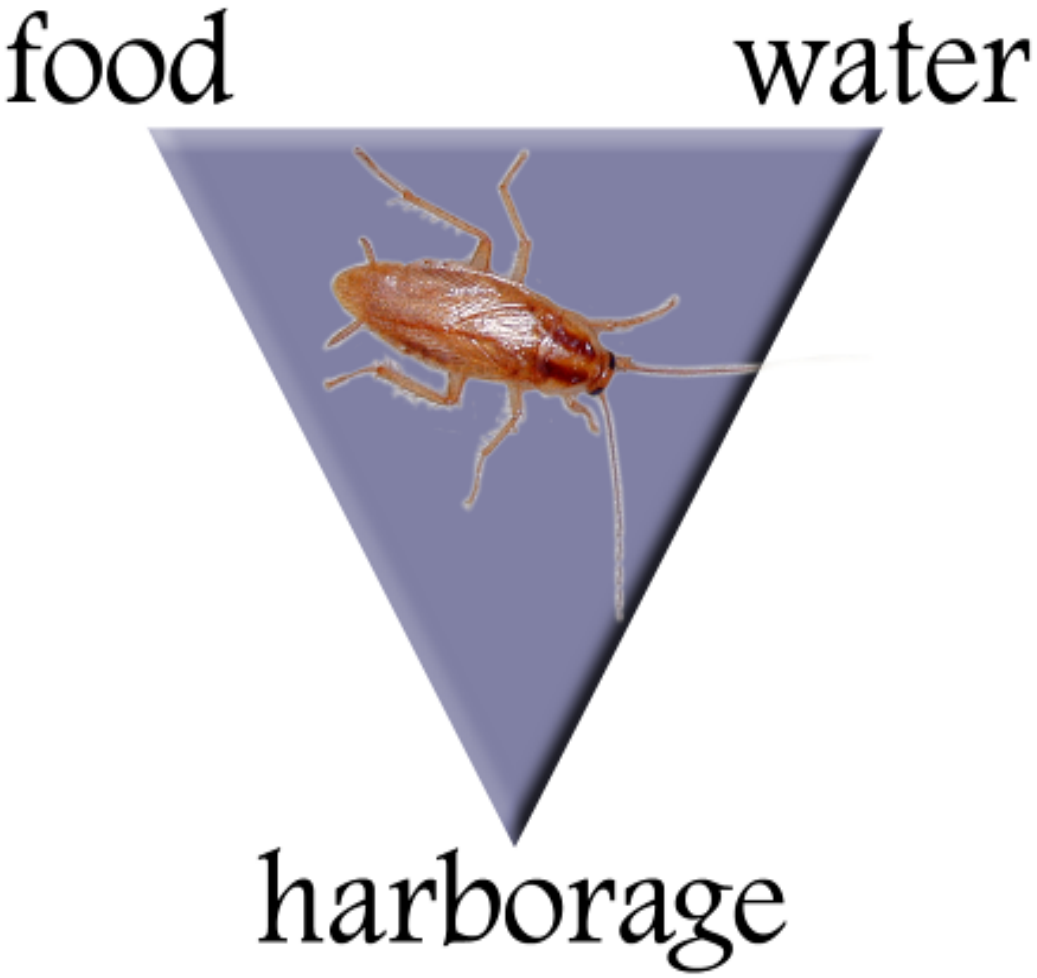
- Phorid flies
  - Cracks in tile
  - Wet areas high in organic matter
  - Rotting flowers, vegetables
  - Broken sewer lines
- Eliminate breeding sites
- Sewer inspections

- Drain flies
  - Cracks in tiles
  - Wet areas high in organic matter
  - Drains
- Eliminate breeding sites
- Use microbial drain cleaner in areas of filth accumulation, drains

What is IPM?



- A balance between pests and pesticides
- Pest populations are managed at acceptable levels
- An environmentally sound approach to pest control
- Risks to people, non-target organisms, and the environment are minimized
- Quality pest control using the least hazardous chemicals and techniques
- Best management practice for schools, food service, restaurants, and all public places



The pest triangle

What is an IPM inspection?

- Goes beyond sanitation
  - Think food police
- Looks for critical thing's pests need
  - food
  - water
  - temperature
  - Harborage
- ***Think Bug Detective or Doctor***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AMERICAN RANGE

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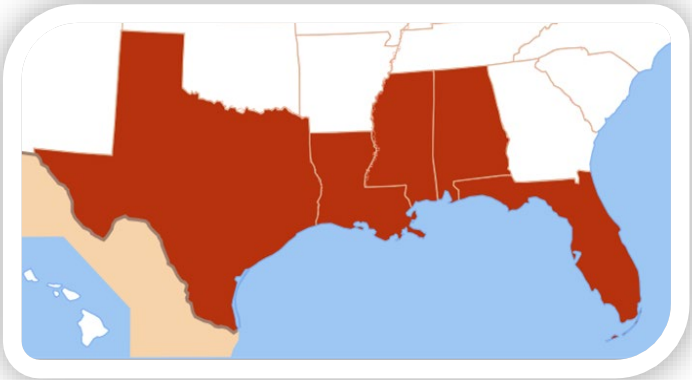
Strengthening Training, Evaluation, and Partnerships in the Prevention and Control of Vector-Borne Diseases



Purpose:

Create a strong comprehensive, multi-sectorial Gulf South regional network that leverages existing infrastructure to train professionals and students in vector-borne disease (VBD)control.

To receive information about the Gulf South VECTOR Collaborative, register using the QR code:

Funded by the Department of Health and Human Services, Center for Disease Control and Prevention, 1 NU50CK000638-01-00

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United States Department of Agriculture
National Institute of Food and Agriculture

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Thank You

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