



Bell-Ringer


Forensic Science


- Maggots have been associated for being “Bad”, as it relates to health. Is there any positive contributions maggots have in medicine or any other application? List and Explain, using complete sentences.
- Due at the end of class
- A) Bell-Ringer and Journal


Forensic Entomology



What the heck is that?

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- The use of “bugs” to find out about our dead body
 - They help us determine:
 - How
 - Why
 - Location
 - Sometimes the insects are the killers themselves- people are allergic after all
 - Car accidents- hysteria/distraction
 - Insect in car, swatting it, fearful of it- you lose control

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- Sometimes, they are used as murder weapons
 - How?
 - Okay, drugs stay in your body after you die, but it is hard to remove samples from the body, but the “bugs” keep the poison in them
 - Maggots, empty puparia, and larval skin casts keep poisons in them
 - Blend them up, and run a GS on them

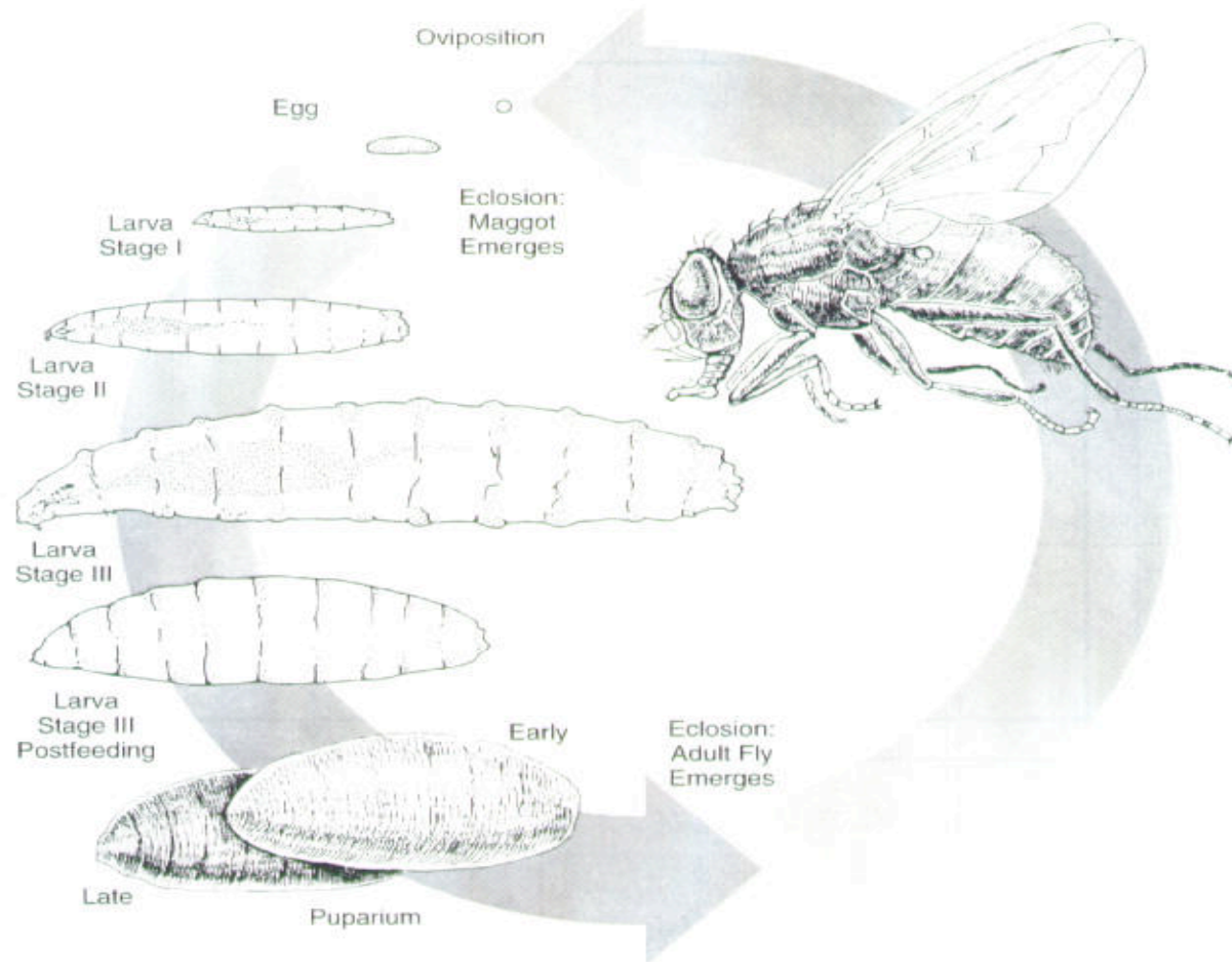
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- Also, drugs influence their life cycle
 - Speeds it up (cocaine)
 - Knowledge of drug history is important
 - If the use of insecticides for suicide, “bugs” will not colonize that area- or delay the colonization
 - Site of fly infestation is also important
 - If trauma or mutilation, you get infestation on those area and not on the usual areas- so this lets us know the wounds may be defensive



Blow Flies-


- Usually oviposition is on natural body openings- the face- eyes, ears, mouth, nose
- NOT REALLY IN THE GENITOANAL AREA- so if we see them there- probably a sexual assault– bleeding
- Must corroborate this with other evidence
- However; after 4-5 days of death, natural decomposition allows for egg deposit in the area


T1 Figure 1-5 Typical blow fly cycle *Courtesy The late E.P. Catts, Ph.D. and Neal Haskell, Ph.D., forensic entomology consultant (<http://www.forensicentomology.com>).*






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- Okay, after we die, we smell
 - This attracts a variety of insects
 - Blow flies, then flesh flies
 - Females lays eggs around natural orifices
 - Such as
 - Nose
 - Eyes
 - Ears
 - Anus
 - Penis
 - Vagina

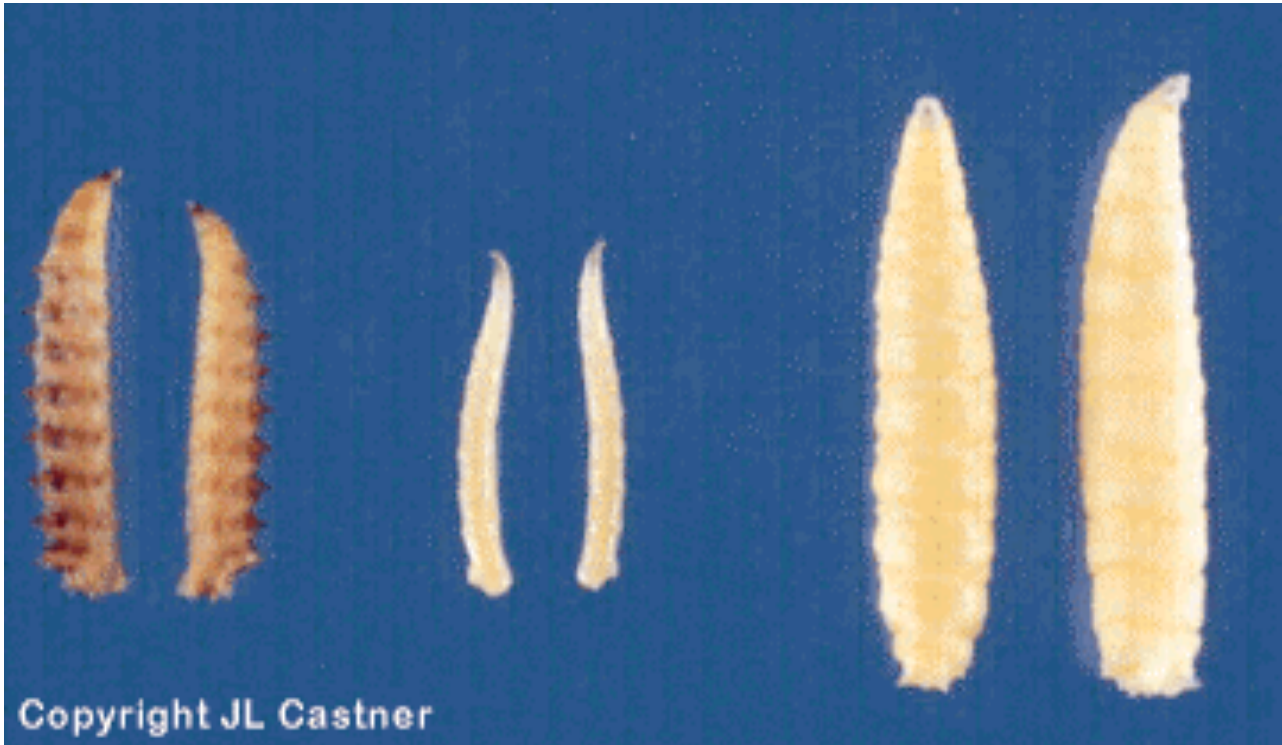
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- If you have wounds, eggs are laid there also
 - Flesh flies do not lay eggs, they deposit larvae instead
 - So generally speaking:
 - Egg → Larva ± prepupal → pupae
 - Each time it grows and feeds and starts to wander
 - It takes 1-2 weeks to reach pupae stage - again depending on ambient conditions

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- The theory behind time of death, or Post Mortem Interval (PMI) is simple:
 - Insects arrive after death
 - Estimating the age of the insects will also estimate the time of death
 - Got it?
 - Good, lets move on.....



Blow flies

- Eggs < 8 hours old
- Egg stage = one day old
- Larvae = 4-5 days old
- Prepupae = 8-12 days old
- Pupae = 18-24 days old
- Empty egg case on dead body is @ 20 days old



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One important concept:

- Succession of organisms thrive on different body parts
- Bone beetles need the bone to be exposed
- Predatory rove beetles feed on maggots



Bell-Ringer


Forensic Science 10/23/2007

- What is the life cycle of the common “Blow Fly.”
- Explain why maggot growth only occurs on dead things?
- @ the end of class...turn in your bell-ringer and journal. Grades will no longer be posted in class...If you have questions regarding your grade you need to make an appointment (Before or After School ONLY!)



Just for your pleasure

- Some insects live on very dead bodies
- The cheese skipper larvae appear 3-6 months after death
- They have been found on bodies that have been dead 3-10 years
- AND are buried 3-6 feet deep
- Just a thought.....




Okay, did the death occur in the fall or winter?

- In winter, usually no insects on the body when the snow melts
- If in the fall- larvae are usually few
- Again, if in the fall:
- Usually found in back on mouth
- Stomach
- Lungs
- Anywhere it is warm









Has the body been moved after death?

- How can you tell?
- Lividity is one way
- Once again, look at our insect friends
- Fungi, bacteria and other animals will devour a dead body
- Leakage of body fluids changes the landscape underneath

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- This leakage causes some bugs to leave, and others to come- it depends on the bugs
 - Also, some flies like sunny locations, some do not
 - If body is concealed, flies should have no access- if you find flies.....
 - Some insects are found in the city, some only in the country


Analyzing the crime scene for entomological evidence

-  Visual observation and notation
-  Collection of climatological data
-  Collection of specimens BEFORE body is removed
-  Collection of specimens from surrounding areas before removal of remains (up to 6 meters)
-  Collection from directly under and in close proximity to the remains.



What should you look for at the crime scene?


- Type of habitat- rural, urban, forest, aquatic, in a building, outside...
- Finding insects that belong to the habitat are important. If they don't belong, body was moved
- Estimate the number and kinds of flying and crawling insects
- Note locations of major infestations
- Note immature stages of insects

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- Note any insect predation- beetles, ants wasps
 - **NOTE** the **EXACT POSITION** of the body- where is the head, the arms and legs, what part is in the sun, etc...
 - Note insect activity within 3-6 meters of body
 - Note any unusual naturally occurring, man-made, or scavenger-caused phenomenon which could alter the environmental effects of the body (trauma, mutilation, burning, covering, burial, movement, dismemberment
 - **PHOTOGRAPH, PHOTOGRAPH, PHOTOGRAPH**



Collecting

- Bugs- use sticky traps, insect nets, collect maggot mass and place on medium to grow them
- Weather:
- Temperature at ground, and 0.3 meters and 1.3 meters
- Body temperature
- Underbody temperature
- Maggot mass temperature

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- Ground temperature
 - Directly after the body has been moved
 - 1-2 meters away
 - 4cm and 20 cm in the soil
 - Under any grass, leaves, etc.
 - Data from meteorological station
 - HI and LOW temp, Humidity, precipitation



What do we do then...

- Determine whether or not the body has been moved
- Is there any ante mortem administration of drugs, alcohol
- Determine the cause of death