

Murder Investigation #1

Police Report

Body of a female was found in an alley behind the dumpsters in a major U.S. city.

No apparent wounds were observed on the body.

Weather Report

Daytime temperatures have been fairly consistent for the past three weeks ranging from 70 to 74 °F.

Questions

1. Approximately how long has this person been dead?

2. Why are maggots of different ages found in the body?

3. Besides temperature, what abiotic conditions should be obtained from weather stations to confirm the estimation above?

Murder Investigation #2

Police Report

Body of a young male was found inside an apartment in a major U.S. city. Maggots were found concentrated in the head and chest region. The windows were closed, although the open curtains allowed sunlight to enter, and the air conditioner was set to 72 °F.

Weather Report

Daytime temperatures have been variable over the past three weeks ranging from 75–94 °F. Skies have been sunny.

Questions

1. Approximately how long has this person been dead?

2. What effect, if any, does the outside temperature have on your estimation of time of death?

3. How does the fact that the windows were closed relate to the population of flies you observed in and around the corpse? (i.e., is there something different about this population than the population in investigation #1?) How do you explain the absence of *Calliphora vomitoria*?

4. Do you suspect foul play? Explain.

Murder Investigation #3

Police Report

Body of a young male was found in a field near a small rural town. The autopsy report reveals that cocaine was present in the body.

Weather Report

Daytime temperatures have been unusually warm over the past three weeks ranging from 84 to 86° F.

Questions

1. Approximately how long has this person been dead?

2. What effect, if any, does cocaine have on your estimation of time of death? Explain how you used this information in calculating the post-mortem interval.

3. What effect, if any, does the temperature have on your estimation of time of death? Explain how you used this information in determining the post-mortem interval.

4. What insects were found on the victim? Is this consistent with where the body was found?

5. Does the location of the body suggest foul play? Explain

Murder Investigation #4

Police Report

Body of an elderly female was found in a dense, evergreen forest far away from any urban area.

Weather Report

Daytime temperatures have been averaged over the past three weeks ranging from 70 to 73° F.

Temperatures in the woods would be approximately 5° cooler due to the lack of sun in the shady environment.

Questions

1. Approximately how long has this person been dead?

2. What effect, if any, does the temperature have on your estimation of time of death?

3. Does the location of the body and the types of insects found suggest foul play? Explain.

Maggot Life History Sheet

The development of body length (in millimeters) of some fly species during their metamorphosis at 72 °F (L = Larva, P = Pupa, A = Adult fly).

Day after death	Species			
	<i>Musca domestica</i>	<i>Calliphora vomitoria</i>	<i>Sarcophaga carnaria</i>	<i>Piophilina nigriceps</i>
1.		Egg	L 9–11	
2.	Egg	L 9–11	L12–16	
3.	Egg	L 9–11	L 17–20	
4.	L 6	L 12–16	L 21–25	
5.	L 6	L 12–16	L 26–30	Egg
6.	L 7–11	L 17–20	L 31–35	Egg
7.	L 12–16	L 17–20	L 36–40	L 3
8.	L 17–20	L 21–25	L 41–44	L 3
9.	L 21–25	L 21–25	L 44–46	L 4–6
10.	L 26–30	L 26–30	L 44–46	L 7–9
11.	L 31–35	L 26–30	P 38–40	L 10–13
12.	P 26–29	L 31–35	P 38–40	L 14–16
13.	P 26–29	L 31–35	P 38–40	P 13–15
14.	P 26–29	P 31–34	P 38–40	P 13–15
15.	P 26–29	P 31–34	P 38–40	P 13–15
16.	P 26–29	P 31–34	P 38–40	P 13–15
17.	P 26–29	P 31–34	P 38–40	P 13–15
18.	A 30–32	P 31–34	P 38–40	P 13–15
19.		P 31–34	A 42–45	A 16–18
20.		P 31–34		
21.		A 36–38		

Color Key: White = *Sarcophaga* Blue = *Musca* Green = *Calliphora* Red = *Piophilina*
 Black = Pupa (cannot determine the species of pupae except by size)

Ecological information for certain species of flies. The development delays/accelerations are given in number of days relative to the developmental schedule in the Species Table for 72 °F.

		<i>Musca domestica</i>	<i>Calliphora vomitoria</i>	<i>Sarcophaga carnaria</i>	<i>Piophilina nigriceps</i>
Temperature (°F)	55°	delayed 4	delayed 4–5	delayed 4	delayed 3
	65°	delayed 2	delayed 3	delayed 2	delayed 1
	80°	accelerated 1	accelerated 2	accelerated 1–2	accelerated 1
	85°	accelerated 3	accelerated 4	accelerated 3	accelerated 2
Ecological traits	Habitat	urban and rural	urban and rural	urban and rural	urban
	Lighting	full to partial sun	partial sun to shady	prefers sunny	prefers sunny
	Drugs	no effect	accelerated 2–3 days	no effect	no effect