NC STATE UNIVERSITY

Forensic Entomology

Introduction

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Forensic Entomology

The study of insects and their arthropod relatives that interact with legal matters.

Humans have existed on the planet for about 7 million years.

Comparatively, insects have been on the Earth for 350 million years.

Historical Review

- First published account in 1855 (France)
- Article series which made legal professions aware of entomology (1883-1898)
- First actual case: 1235AD: *The Washing Away of Wrongs*

Forensic Entomology

- Urban

Forensic Entomology

- Urban
- Stored Product

Forensic Entomology

- Urban
- Stored Product

Forensic Entomology

- Urban
- Stored Product
- Medicocriminal / Medicolegal

Scope and Application

- Determination of the PMI
- Cause and manner of death
- Determination of death location
- Placement of body after death
- Criminal misuse of insects
- Abuse of children and elderly

Traffic Accident and Air Crash Investigation

- Interference with Avionics
- Entomophobia

2002 Accident Study – Virginia Division of Motor Vehicles

Top 15 driver distractions:

1. Rubbernecking (looking at a crash, roadside incident, attractive man or woman, etc.) – 16%
2. Driver fatigue – 12%
3. Looking at scenery or landmarks – 10%
4. Passenger or child distractions – 9%
5. Adjusting radio or changing CD/tape – 7%
6. Cell phone – 5%
7. Eyes not on the road – 4.5%
8. Not paying attention, daydreaming – 4%
9. Eating or drinking – 4%
10. Adjusting vehicle controls – 4%
11. Weather conditions – 2%
12. Unknown – 2%
13. Insect entering or striking vehicle – 2%
14. Document, book, map, directions or newspaper – 2%
15. Medical or emotional impairment – 2%

#	Date	Location	Make/Model	Number	Severity	Operation Type
1	8/30/1967	Clinton, NC	Stinson HW-75	N21138	Nonfatal	General Aviation
2	9/9/1967	Lafayette, LA	Luscombe 8F	N9916C	Nonfatal	General Aviation
3	3/29/1968	Liberty, TX	Grumman G-164	N10287	Nonfatal	General Aviation
4	11/9/1968	Vero Beach, FL	Alon A-2	N5652F	Nonfatal	General Aviation
5	6/19/1969	Jacksonville, NC	Stearman B75N1	N73583	Nonfatal	General Aviation
6	8/2/1972	Chandler, AZ	Bell 47-G5	N7808S	Nonfatal	General Aviation
7	12/23/1972	Valley View, TX	Hiller ACFT UH-12C	N5328V	Nonfatal	General Aviation
8	9/6/1973	Dixon, CA	Piper PA-25	N4717Y	Nonfatal	General Aviation
9	10/31/1073	Merced, CA	Piper PA-24	N5521P	Nonfatal	General Aviation
10	11/18/1973	Baker, FL	Stinson 108	N97378	Nonfatal	General Aviation
11	7/9/1974	Danville, NY	Piper PA-25	N6905Z	Nonfatal	General Aviation
12	6/9/1979	Clovis, NM	Beech A23-19	N6913Q	Nonfatal	General Aviation
13	8/21/1980	Norman, OK	Cessna 150G	N3661J	Nonfatal	General Aviation
14	8/8/1981	Pembroke, NY	Cessna 337A	N6277R	Nonfatal	General Aviation
15	12/10/1981	Venus, TX	Cessna 172	N2894U	Fatal (1)	General Aviation
16	7/26/1982	Woods Cross, UT	Cessna 152	N758YP	Nonfatal	General Aviation
17	8/16/1983	Humble, TX	Cessna 150	N30515	Nonfatal	General Aviation
18	9/25/1983	Orlando, FL	Piper PA 32R-300	N301WA	Nonfatal	General Aviation
19	6/1/1984	Troy, VA	MaulE M-2	N20BS	Nonfatal	General Aviation
20	8/21/1984	Iuka, MS	Piper PA 28-140	N7136R	Nonfatal	General Aviation
21	3/25/1985	Roanoke, TX	Cessna 177	N52690	Nonfatal	General Aviation
22	7/21/1985	Lewisburg, WV	Stinson 108-2	N9818K	Nonfatal	General Aviation
23	7/3/1986	Davenport, IA	Piper PA 24-250	N6FF	Nonfatal	General Aviation
24	7/18/1986	Plainville, CT	Cessna 172P	N65612	Nonfatal	General Aviation
25	5/30/1987	Fredericksburg, VA	Cessna 152	N25448	Nonfatal	General Aviation
26	7/8/1987	Gulf Shores, AL	Piper PA 28-181	N8389Y	Nonfatal	General Aviation
27	6/22/1987	Hillsboro, TX	Piper PA 60-601	N7481S	Nonfatal	General Aviation
28	10/14/1987	Scyrene, AL	Cessna 150H	N22553	Nonfatal	General Aviation
29	7/23/1988	Burleson, TX	Luscombe 8A	N25236	Nonfatal	General Aviation

#	Date	Location	Make/Model	Number	Severity	Operation Type
30	9/5/1988	Houston, TX	American AA1B	N6208L	Nonfatal	General Aviation
31	1/27/1989	Parlier, CA	Beech E33	N8403N	Nonfatal	General Aviation
32	9/28/1989	Marcy, NY	Niedzielski COOT-A	N247D	Fatal (1)	General Aviation
33	1/14/1990	Daytona Beach, FL	Conn One Design	N60RC	Nonfatal	General Aviation
34	9/7/1991	Tranquility, NJ	Boeing PT-17	N3721c	Fatal (1)	General Aviation
35	7/5/1991	Pomeroy, OH	Bellanca 8KCAB	N68560	Nonfatal	General Aviation
36	3/26/1993	Washington, OK	Cessna 182	N5520B	Nonfatal	General Aviation
37	7/21/1994	Archer City, TX	Cessna 140	N2260V	Nonfatal	General Aviation
38	7/26/1994	Greenwood, IL	Cessna 182	N2564R	Nonfatal	General Aviation
39	7/29/1994	Yazoo City, MS	Piper J5C	N74669	Nonfatal	General Aviation
40	1/28/1996	Oroville, CA	Piper PA-28	N992PK	Nonfatal	General Aviation
41	6/21/1996	Lamont, CA	Aeronca 7AC	N2456E	Nonfatal	Agricultural
42	8/24/1996	Phoenix, AZ	Cessna 441	N832AD	Nonfatal	General Aviation
43	11/15/1996	Apple Valley, CA	Beech 35-33	N961T	Nonfatal	General Aviation
44	9/11/1997	Horseshoe Bend, AR	Stinson 108-3	N800C	Nonfatal	General Aviation
45	6/24/1998	Georgia, VT	Extra EA260	N148Gc	Nonfatal	General Aviation
46	8/15/1999	Hudson, MI	Brantly Helicopter B-2B	N2238U	Nonfatal	General Aviation
47	11/9/1999	New Hope, PA	Cessna 150	N8323G	Nonfatal	General Aviation
48	5/23/2000	Pacific Ocean	Beech B200	N24CV	Nonfatal	General Aviation
49	10/19/2000	Concord, CA	Beech 300	N398DE	Nonfatal	General Aviation
50	11/26/2000	Preston, MN	Aerostar PA 60-601P	N713HM	Nonfatal	General Aviation
51	7/14/2001	Moultonboro, NH	Yakovlev 52	N48GA	Nonfatal	General Aviation
52	7/31/2001	Pierre, SD	Aero Commander S2R	N5551X	Nonfatal	General Aviation
53	11/23/2001	Hudson, MI	Bellanca 7KCAB	N86960	Nonfatal	General Aviation

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1-800-368-6498
CB HelpLine
Non-emergency / Planning / Info


INCHES
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4

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Sequence of Colonization

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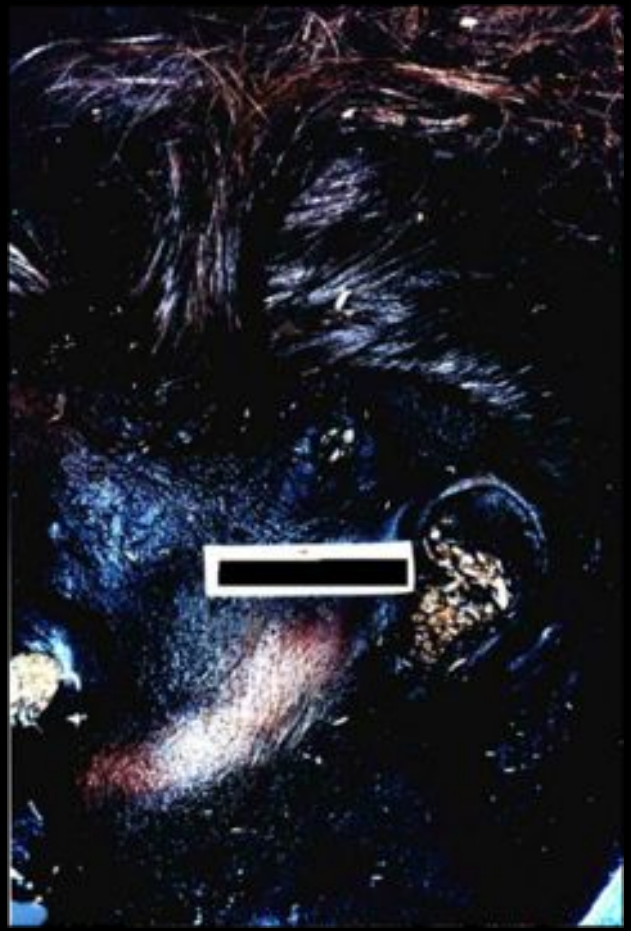
Forensic Entomology – Introduction



The eyes, nose, mouth and ears are typically the first to be colonized by flies.

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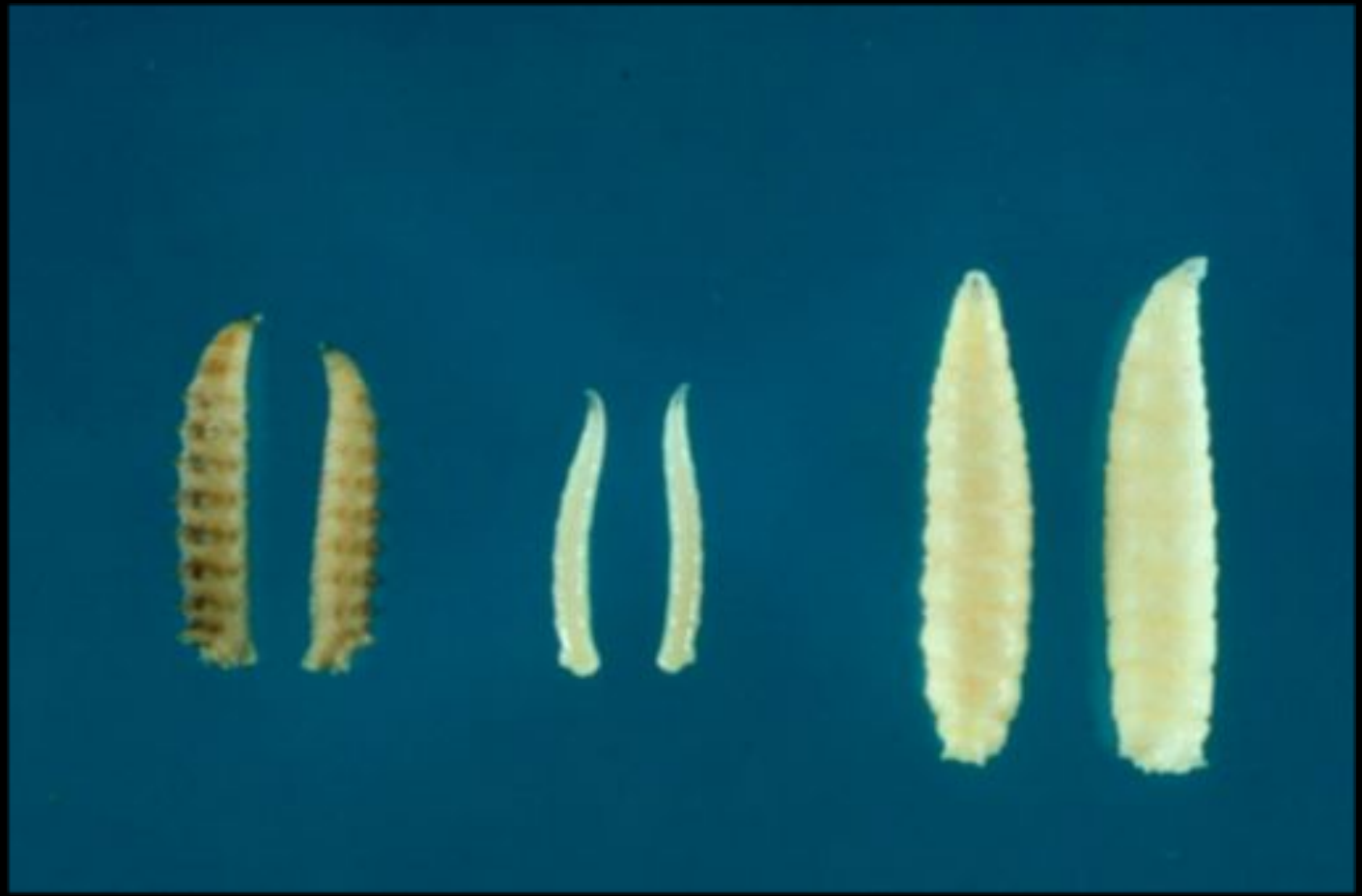

Insect-driven skeletonization progresses from the head downward.

Insect activity on the body will not be “patchy” in distribution during the earlier stages of decomposition unless trauma is present.

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3

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The presence (or absence) of clothes will not alter the common head-downward skeletonization process.

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Insects in Indoor Locations

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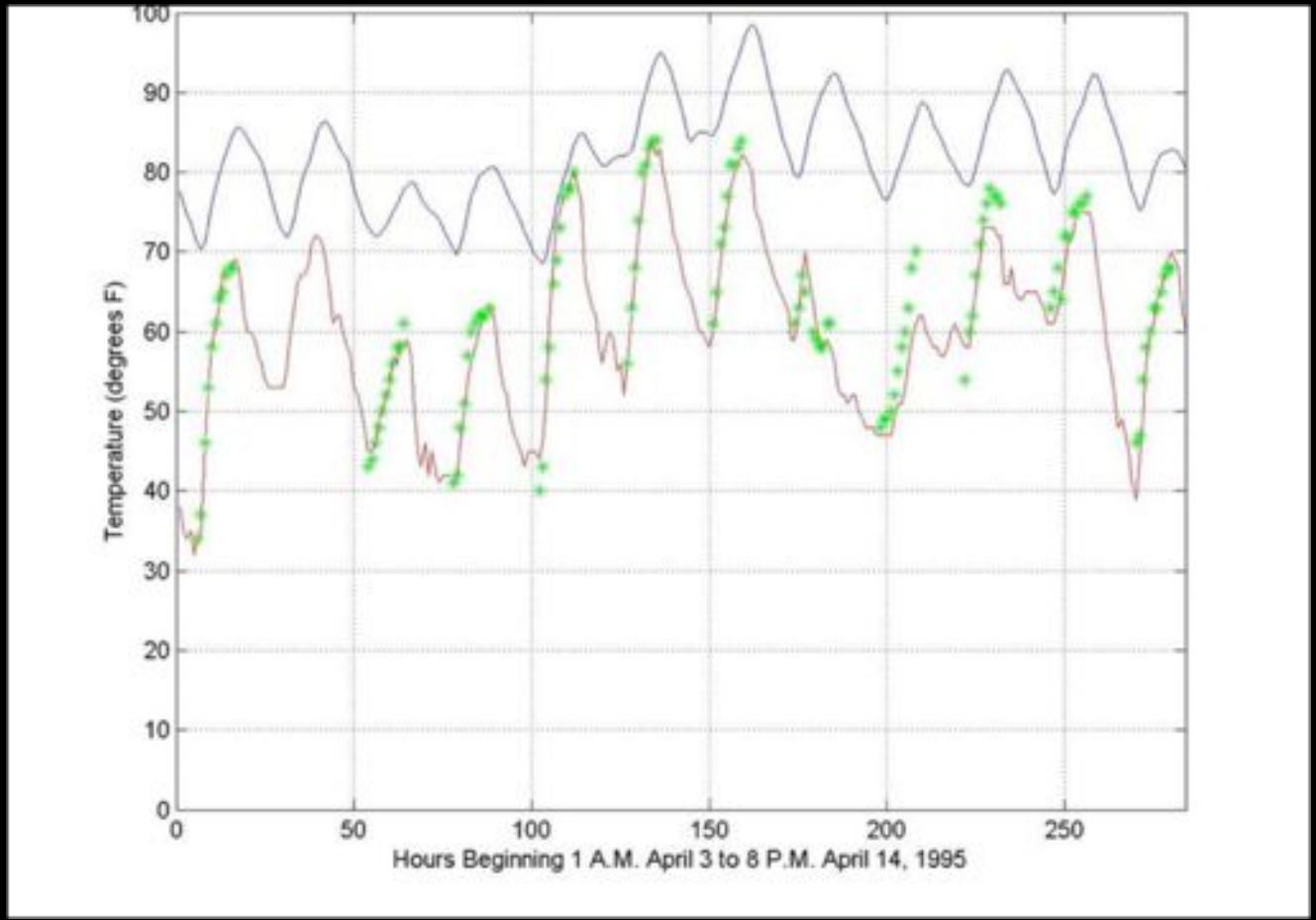
Temperature (degrees F)
0
10
20
30
40
50
60
70
80
90
100
0
50
100
150
200
250
Hours Beginning 1 A.M. April 3 to 8 P.M. April 14, 1995

Insects on Buried Remains

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Insects on Burned Remains

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TR

Insect Artifacts and Decomposition

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Predation by ants can alter the PMI established by a forensic entomologist.

Scavenging by ants can create postmortem defects that may resemble cigarette burns, chemical burns, or abrasions.

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The damage created by roaches may resemble that caused by ant scavenging.

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cm
1
2
SPECIMEN

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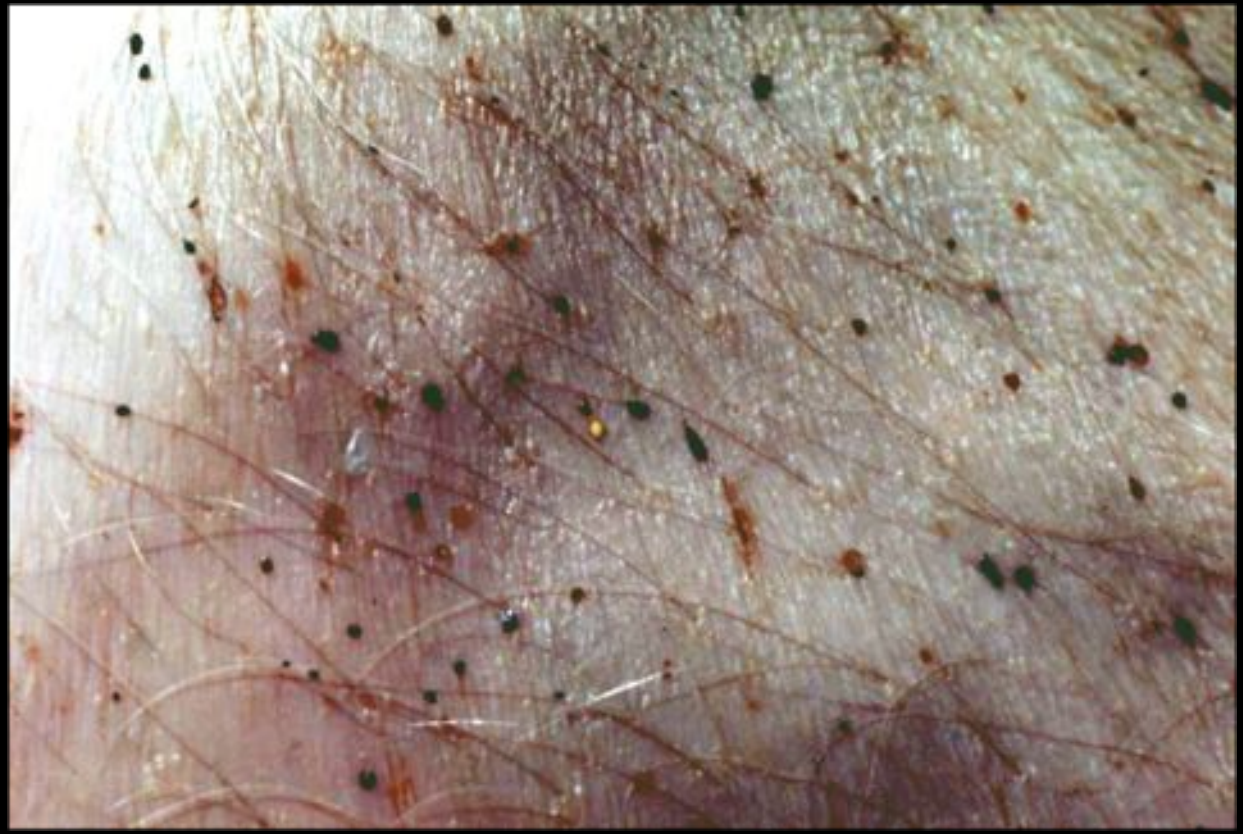
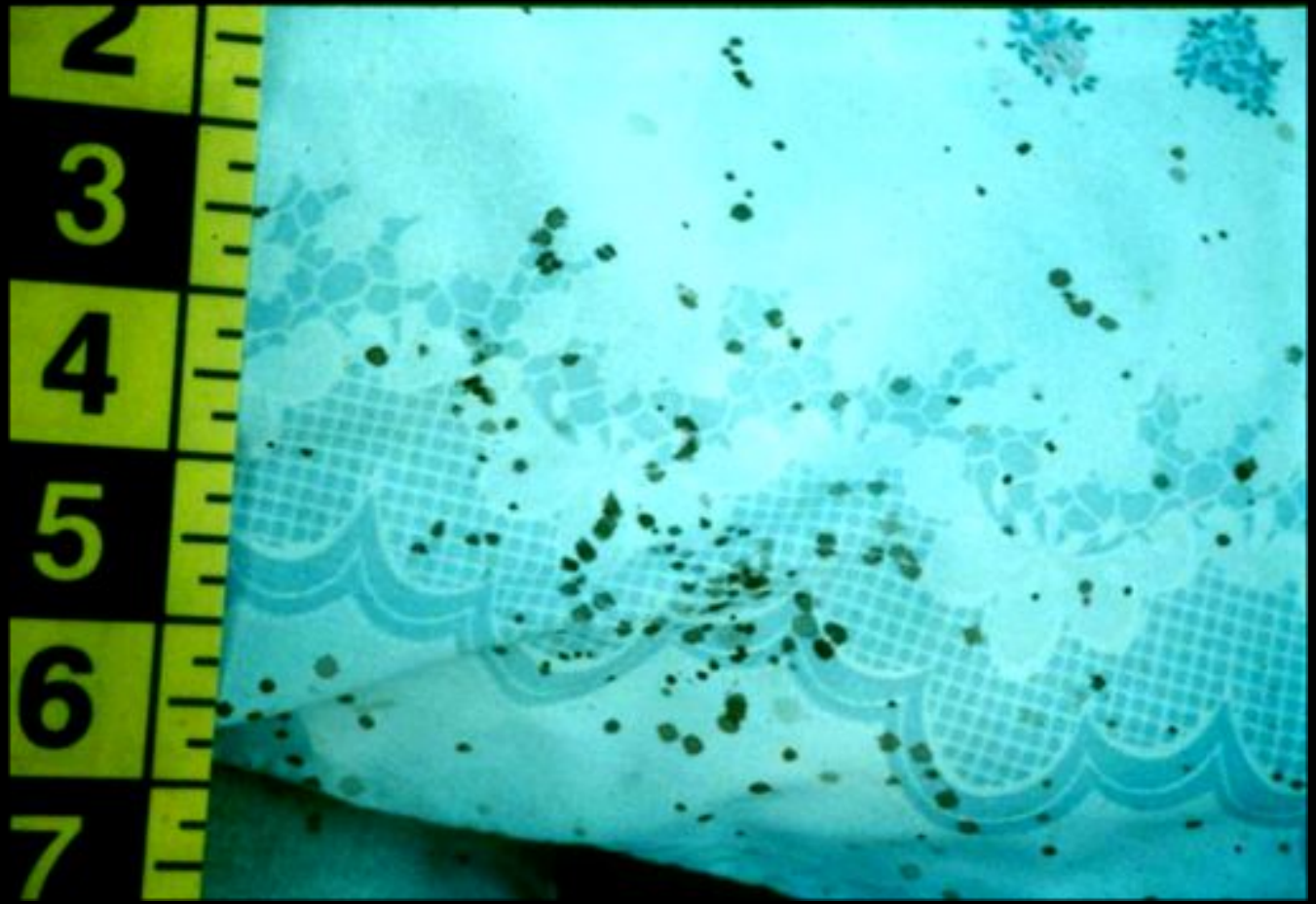


Fly Specs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Aquatic Insects

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