Black Flies
&
Spiders

Continuing Education in Pest Management Series

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Mariposa County Workshop

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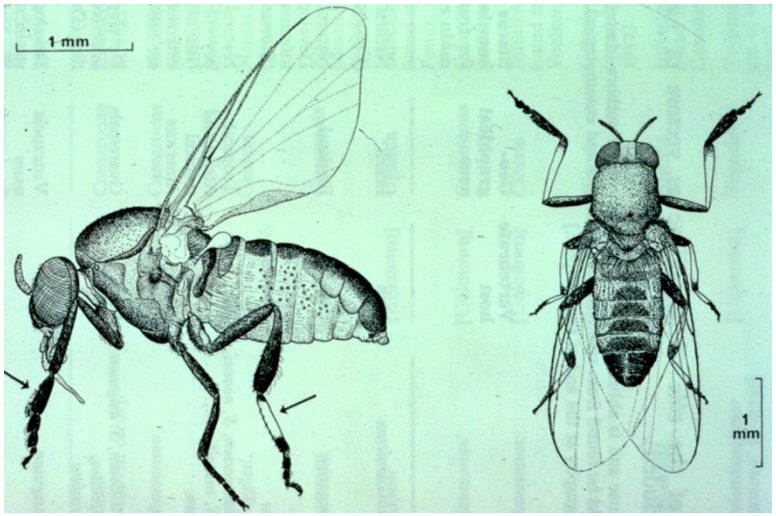
I. The Black flies, Simuliidae

A. Introduction 1000 species

1. Major genus- <u>Simulium</u>
2. "Species" cytotypes and complexes

B. Distribution

1. Common in temperate and subarctic zones
2. A few tropical species



C. Life history

1. Morphology
    a. One to 6 mm long
    b. Color highly variable (rarely entirely black)
    c. Stout, not mosquito-like
    d. Broad iridescent wings
    e. Short blade-like mouth parts, greatly reduced in males

C. Life history- in shallow torrents

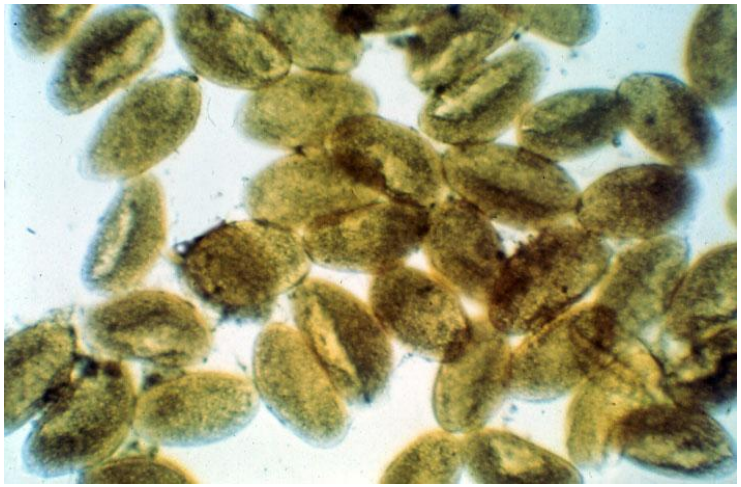
2. Eggs- laid attached or loose

   a. Laid loosely at waters edge, on surface, or dropped on surface during flight

   b. Attached to plants, rocks and logs in splash zones

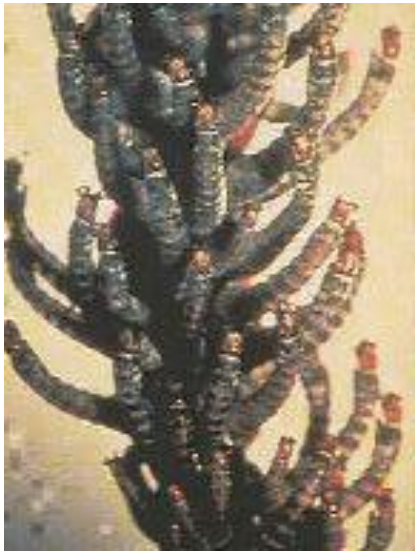
   c. 150-800 per female

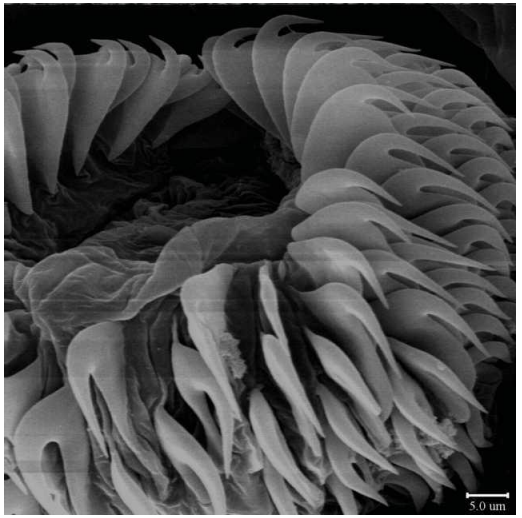
   d. Hatch in 3-14 days or over winter



C. Life history- in shallow torrents

2. Larvae free living ~6 instars
    a. Thoracic and caudal suckers with hooks for attachment to surfaces
    b. Secrete silk for additional anchorage, life line

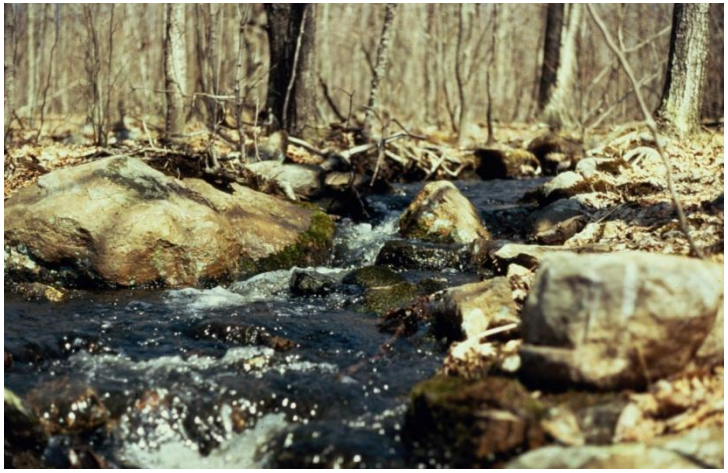




C. Life history- in shallow torrents

3. Larvae
    c. Habitat
        1) Riffle zones of streams, rivers, few in stagnant water

2) Downstream side of rocks, logs and debris



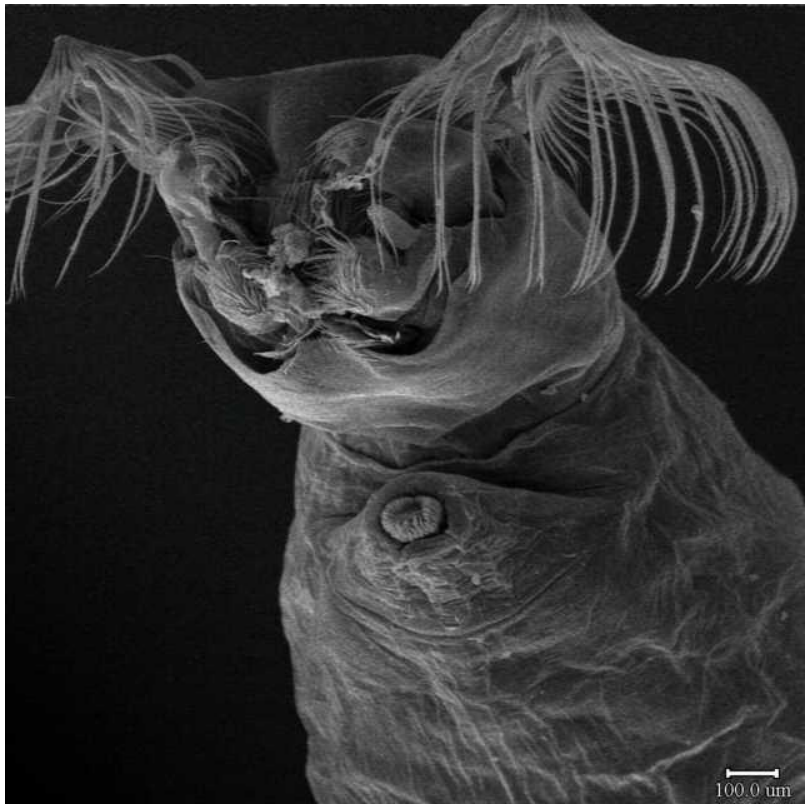
3) Certain species attach to Crustacea or insects

C. Life history- in shallow torrents

4. Larvae

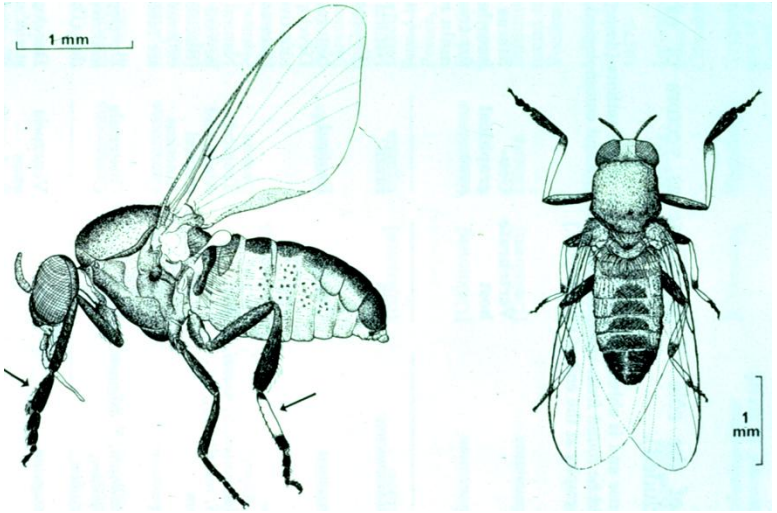
   d. Feed as omnivorous on aquatic micro biota

   e. Filter feeders for the most part



C. Life history- in shallow torrents

5. Pupate in shoe-shaped silken cocoon
    a. Two days to 4 week pupal period
    b. Same aquatic habitat as larvae
    c. Gills (respiratory filaments)
    d. Adult rapidly emerges- rises to surface in hydrophobic meniscus



C. Life history- in shallow torrents

6. Adult biology
    a. Generation time is 8-15 weeks
    b. Adults live 2-3 weeks
    c. Foods
        1) May fly 10 to 20 Km in search of blood (Females)
        2) Both sexes take carbohydrates
        3) Some species are autogenous
    d. Mating
        1) Male swarms over breeding sites
        2) Parthenogenesis (rare)

D. Host relationships and feeding

1. Host relationships
    a. Broad host ranges
    b. Some host specific – Anthropophilic
2. Feeding behaviors
    a. Blood feeding process poorly known- pool from lacerating dermal capillaries
    b. Diurnal, outdoor biters
    c. Swarm feeders

II. Spiders

A. Significance of the spider bite depends on three Factors

1. Only a few have these three factors
    a. An ecology that overlaps that of humans
    b. Chelicerae that can penetrate human skin
    c. Venom that is seriously toxic to humans
2. Lacking any one- spider is beneficial

II. Spiders

B. The bite

1. General case- no spider seeks out humans to bite or suck blood or for any other reason
    a. Spider bite usually terminal mistake for spider
    b. Human blunders into the web
    c. Accidentally crushes spider with unprotected extremity
    d. Spider mistakes movement of the human as prey
2. Numerous kinds of venom- for subduing prey

II. Spiders

C. Brown spiders, Family Loxoscelidae

1. About 20 species
2. Physical characteristics

a. Small, delicate, long-legged spiders, 1.5- 2 cm dia (legs stretched out)
b. Light brown or gray brown
c. Dark brown violin pattern on dorsal surface of cephalothorax
d. Three pairs of eyes (most spiders have four pair)

II. Spiders

C. Brown spiders, Family Loxoscelidae

3. Distribution

L. apachea – Red
L. arizonica – Olive
L. blanda - Light Blue
L. deserta – Orange
L. devia – Purple
L. kaiba - Light Grey
L. reclusa - Dark Grey
L. russelli – Blue
L. sabina - Light Green

a. No *L. reclusa* outside original distribution!
b. No Brown spiders in Northern CA!

III. Spiders

C. Brown spiders, Family Loxoscelidae

4. Biology of L. reclusa

a. Nocturnal predator of small arthropods

b. Flat (two-dimensional) glossier nest 3-7 cm in diameter

1) Under rocks or boards covered with organic debris, particularly under trees or shrubbery

2) In peridomestic environment: undisturbed locations in garages, barns, storage areas- under boxes, stacks of paper, woodpiles

c. Not found wandering in gardens, foliage, diurnally

II. Spiders

C. Brown spiders, Family Loxoscelidae

5. The bite

a. Occurs when human disturbs web or at night when spider is foraging

b. <u>May</u> cause small necrotizing lesion

Initial transient stinging sensation

Pruritus, pain, small blister 3-24 hrs

<u>Maybe</u> gradually enlarging lesion in 48-96 hrs

Lesions seldom larger 1 cm; resolve in six weeks

c. Very minor systemic symptoms

II. Spiders

D. Black widow

1. Broadly distributed
2. Messy three dimensional web in hidden locations
3. Serious, neurotoxic bite- central effects that last for about two weeks

   Nausea, vomiting, tetanic convulsions

   Abdominal cramps, headache, prostration

II. Spiders

D. Brown widow

1. Introduced to Florida and Southern CA
2. Messy three dimensional web in hidden locations
3. Milder neurotoxic bite- central effects that last for about one week
4. Egg case totally different

II. Spiders

E. Tarantulas

1. Local varieties not very toxic
2. Vesicating hair on abdomen flicked into eyes by hind legs
3. Pet trade exotics can be extremely dangerous

II. Spiders

C. Other medical significance

1. The hysteria factor- spiders and webs are object of various psychological disturbances

a. Delusion

b. Paranoia

c. Psychoses

B. Brown spiders, Family Loxoscelidae

1. Perhaps twenty species of "Brown Spiders"

   a. Loxosceles reclusa - (Brown recluse) Southern USA west to San Antonio

   b. Loxosceles deserta - Southern CA

   c. Loxosceles leata - Introduced to MCZ in Boston (now extinct) and LA basin