MOSQUITOES: THEIR LIFE CYCLE AND LARVAL HABITATS

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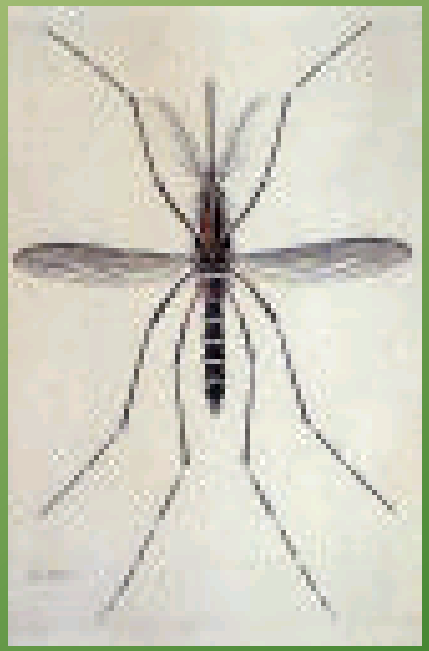
WHAT ARE THEY?

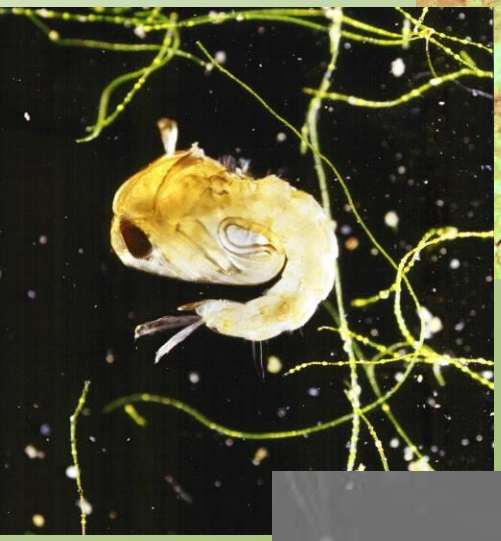
- **Insects- 6 legs, 2 wings, many species**
- **Born in water then hatch out into a flying adult**

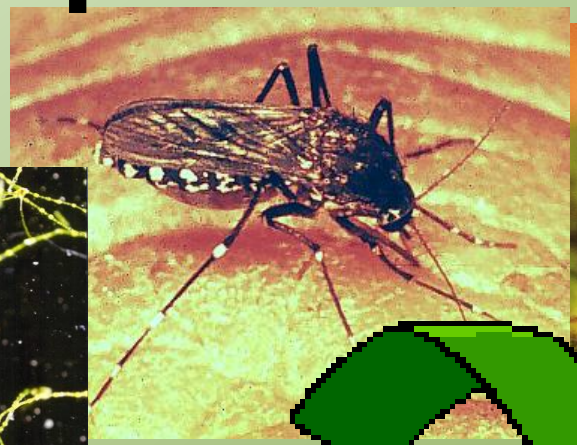


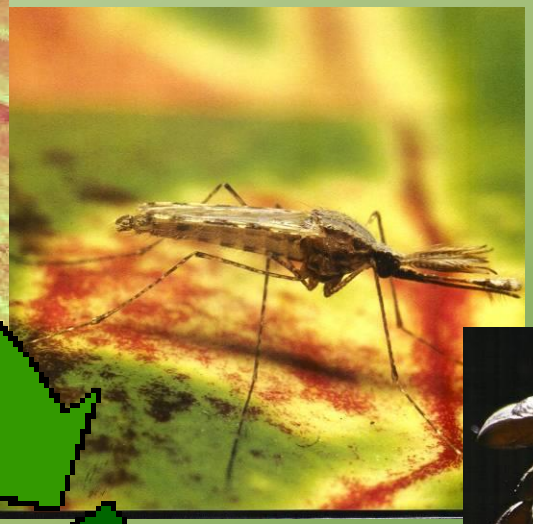
How do you know when they're around?

Because They Find You!

Mosquito Development Cycle

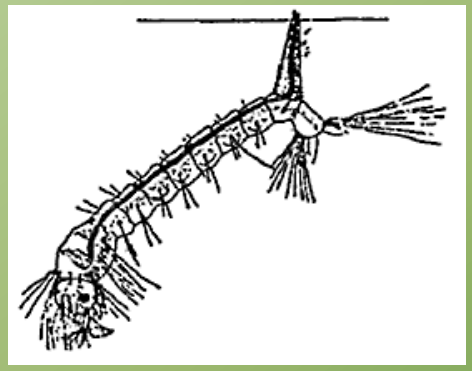




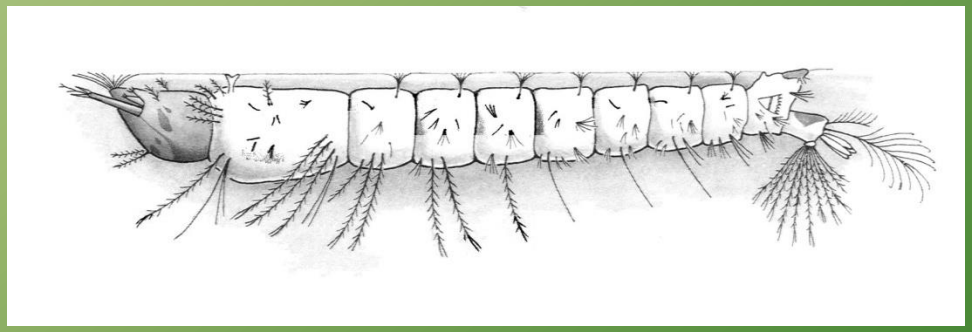


Types of Larvae = “wigglers”

- **Culicine**: All genera other than Anopheles
  - Culex, Ochlerotatus, Aedes, Psorophora

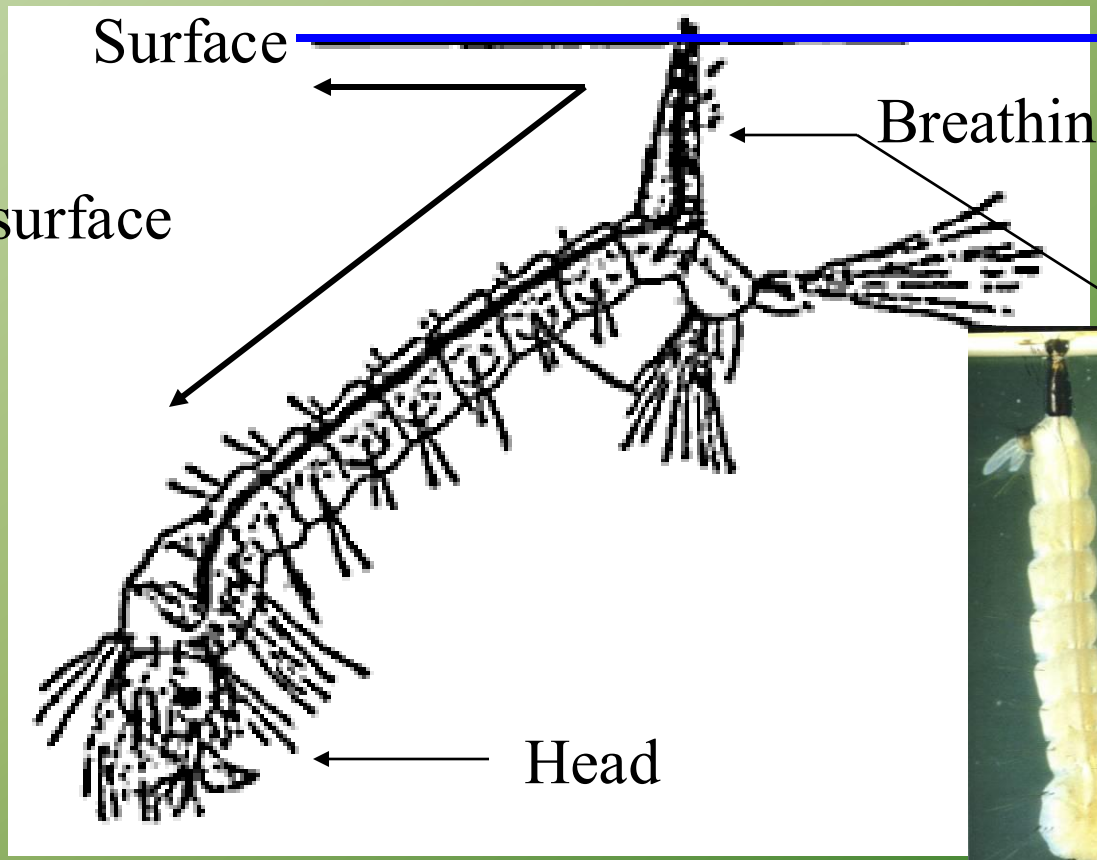


- **Anopheline**: All the Anopheles species

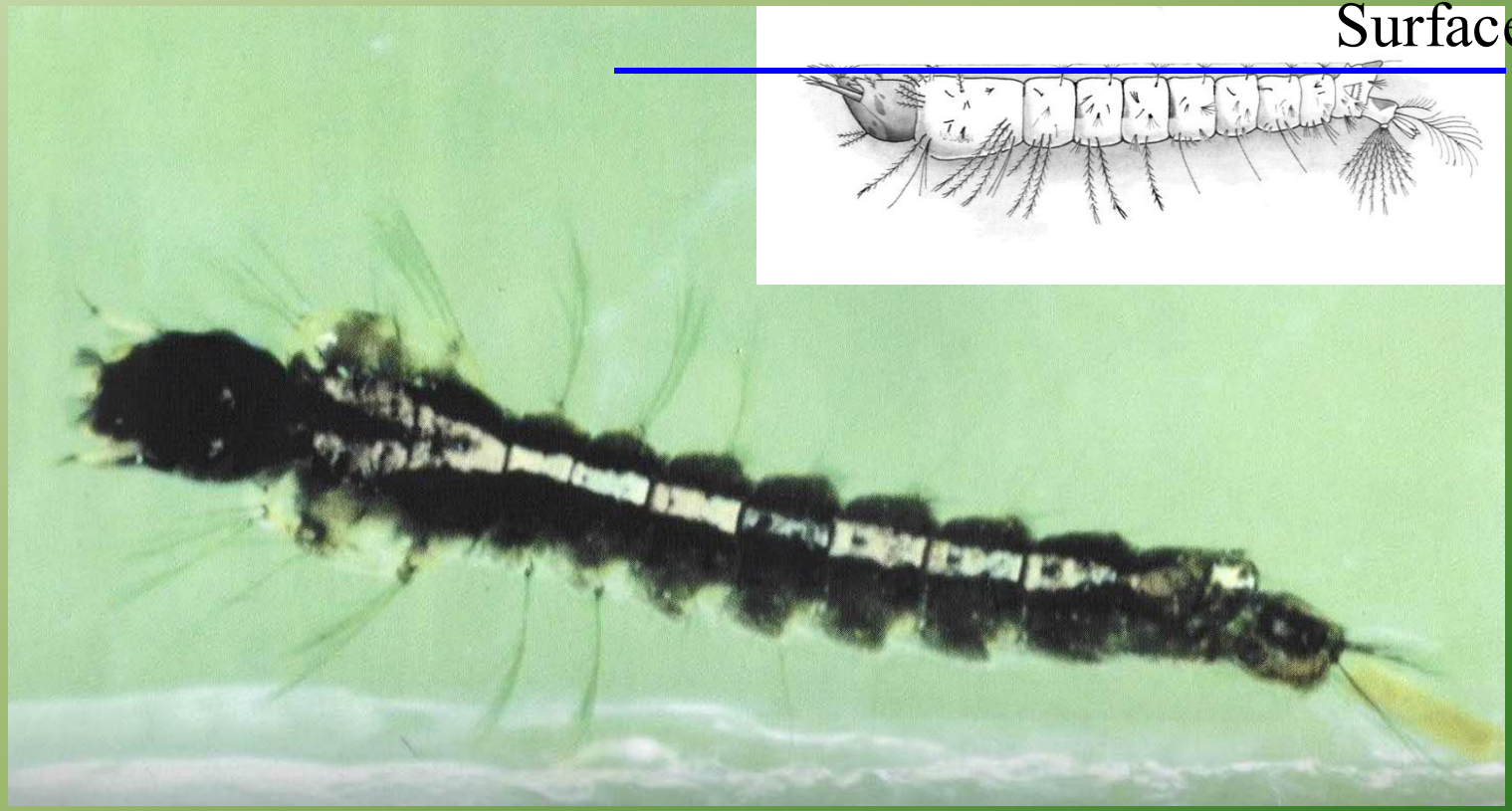


Culicine Larvae

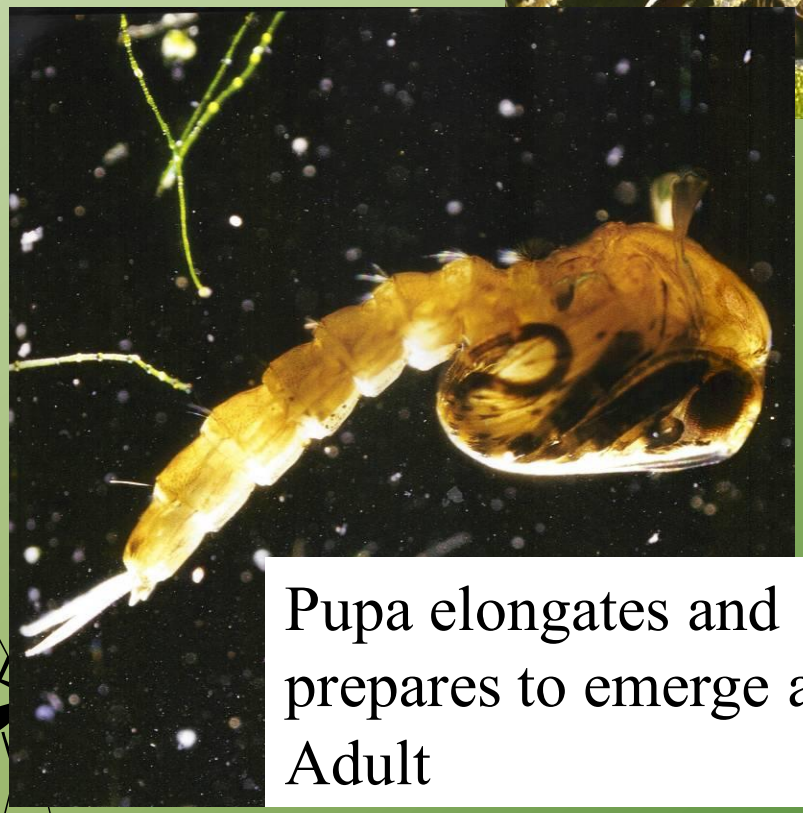
Hang from surface
at an angle



Anopheline Larvae



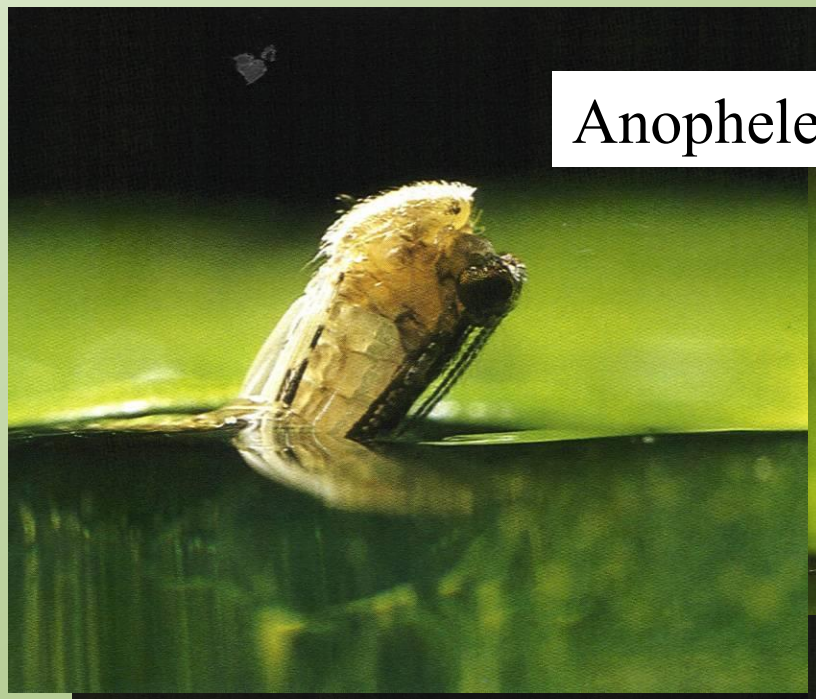
1st. Instar Larvae



Pupa elongates and prepares to emerge as an Adult

4th. Instar sheds and becomes Pupa

Anopheles Emerging

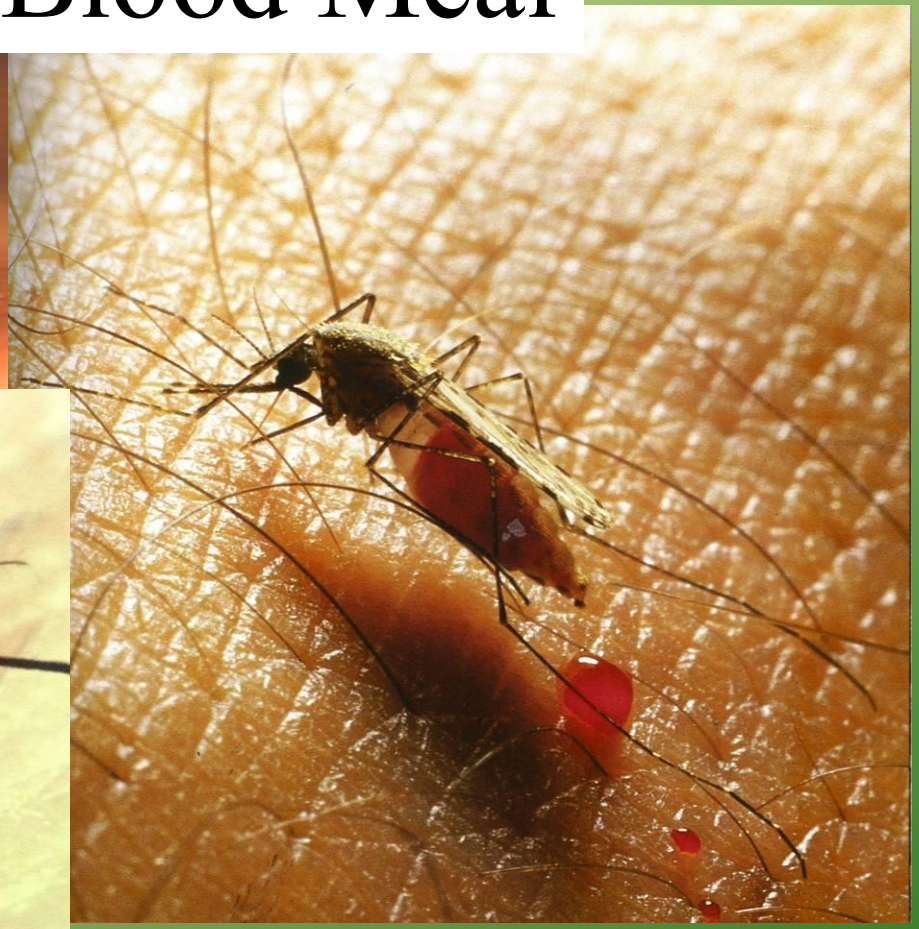


Teneral Adult on surface

WHAT DO THEY EAT?

- Plant juices & nectar
- They also need blood from other animals

The Blood Meal



WHY DO THEY NEED YOUR BLOOD?

- Only females need your blood
- They use the blood to help develop eggs

And now there will be *more* mosquitoes!

WHAT ARE MOSQUITO LARVAL HABITATS?

- ANY WATER COLLECTED ON SOIL OR IN CONTAINERS (ARTIFICIAL OR NATURAL) THAT WILL SUPPORT THE DEVELOPMENT OF MOSQUITO LARVAE TO THE ADULT STAGE.

WHY YOU NEED TO KNOW ABOUT MOSQUITO LARVAL HABITATS?

BECAUSE:

- The best method to control mosquitoes is by targeting the larval stage, because they are confined to easily found sites
- If you wait until the adults emerge, they fly in all directions, are not concentrated like larvae, and are hard to control.
- Thus, targeting mosquito larvae for control is very "*PROACTIVE*".

MOSQUITO LARVAE ARE FOUND AROUND THE WORLD, EXCEPT ANTARCTICA. FROM 3,000 FT BELOW THE SURFACE IN MINES TO 16,000 FT ELEVATION IN THE HIMALAYA MOUNTAINS.

A BASIC CLASSIFICATION OF LARVAL HABITATS INCLUDES:

- SOIL-BASED WATER COLLECTIONS, WHICH INCLUDES: PERMANENT, SEMI-PERMANENT, TEMPORARY (FLOOD, RAIN, BRACKISH WATER POOLS), AND RUNNING WATER COLLECTIONS.
- CONTAINER WATER COLLECTIONS, EITHER ARTIFICIAL OR NATURAL.

SOME COMMON SPECIES FOUND IN SOIL-BASED HABITATS

-Aedes vexans
-Anopheles punctipennis
-Anopheles quadrimaculatus
-Coquillettidia perturbans
-Culex quinquefasciatus
-Culex salinarius
-Ochlerotatus atlanticus-tormentor
-Ochlerotatus canadensis
-Ochlerotatus japonicus
-Ochlerotatus sollicitans
- Ochlerotatus taeniorhynchus
- Psorophora ciliata
- Psorophora ferox

Habitat: Timbered Land

Habitat: Secondary Ditches

Black gum swamp

Habitat: Cypress Swamp

Habitat: Woodland Pool

Neighborhood Woodland Pool Part 2

Habitat: Tree “Blow Downs”

Dip around the edges for *Oc. canadensis*, not the middle!


Wendy's

Habitat: Marsh Transition

WHAT LARVAL HABITATS PRODUCE THE MOSQUITOES CAUSING THE MOST COMPLAINTS?

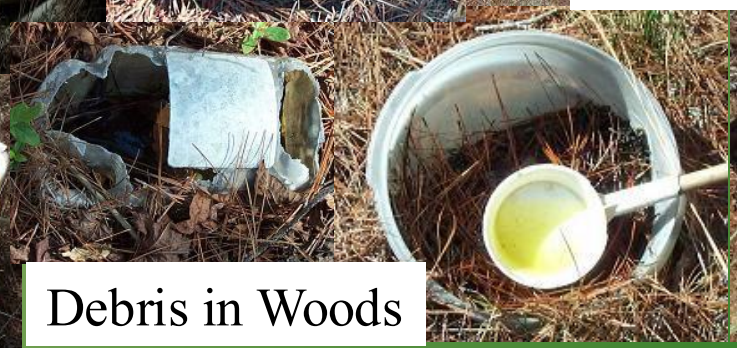
- THEY ARE NOT THE DITCH, CREEK, POND, OR LAKE ON THE NEIGHBOR'S PROPERTY!
- *IN MOST CASES THE HOME OWNER PRODUCES THE PROBLEM MOSQUITOES IN VARIOUS NATURAL AND ARTIFICIAL CONTAINERS ON THEIR OWN PROPERTY.*
- DURING LOW TO AVERAGE RAINFALL YEARS ABOUT *80-90%* OF MOSQUITO COMPLAINTS IN NC COME FROM CONTAINER SPECIES.
- DURING EXCEPTIONALLY WET YEARS THE SOIL-BASED MOSQUITOES BECOME A MUCH BIGGER PROBLEM.

MANY VERY IMPORTANT VECTOR SPECIES BREED IN CONTAINERS

Tire Piles

Back Yard Clutter

Buckets

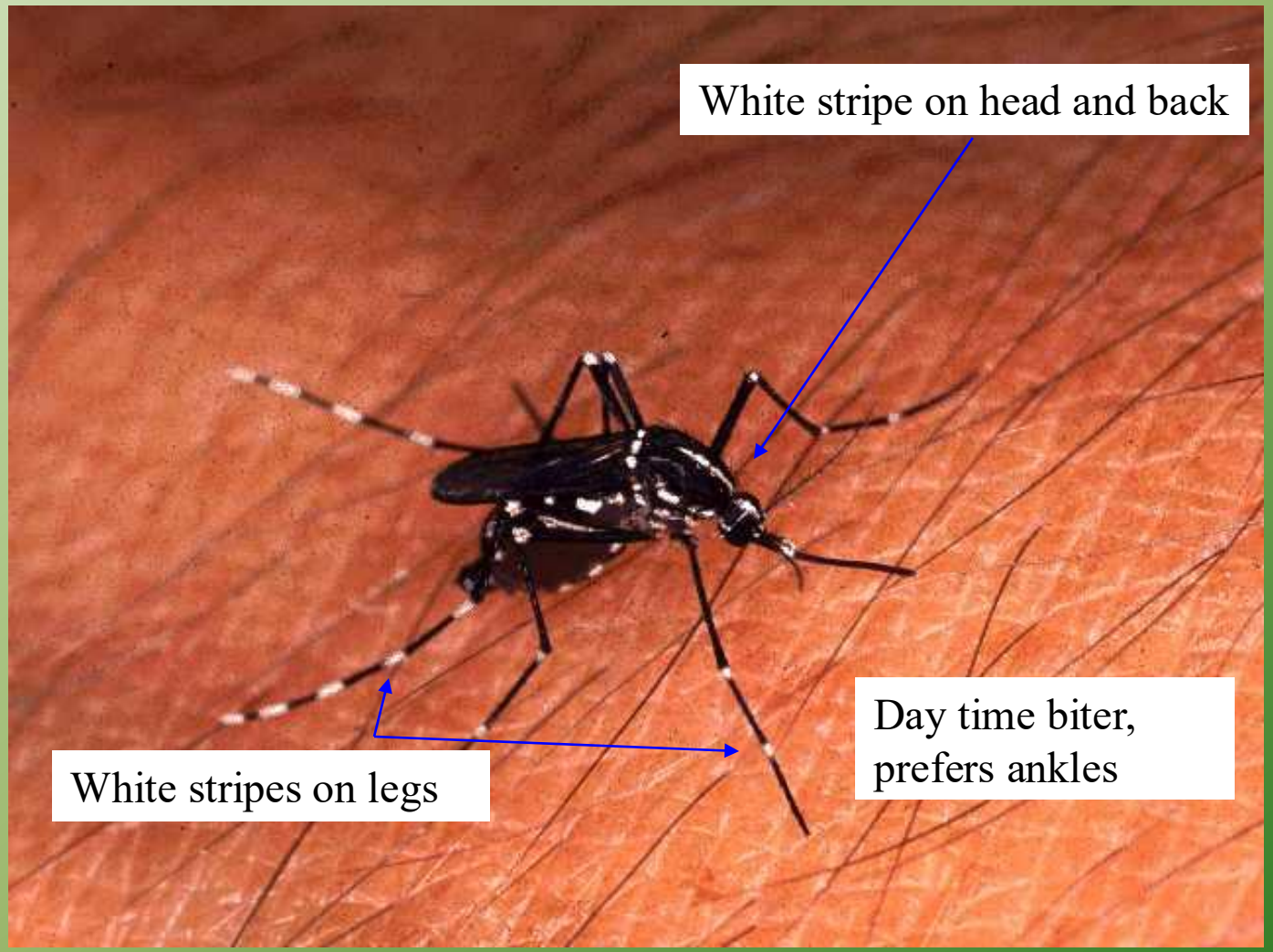


Debris in Woods

IMPORTANT MOSQUITO VECTORS FOUND IN CONTAINERS

- *Ae.albopictus* - EEE, WN, LAC to humans
- *Oc.japonicus* - WN +? to humans
- *Oc.triseriatus* - EEE, WN, LAC to humans
- *Cx.pipiens* - WN, SLE vector in bird cycle
- *Cx.restuans* - WN vector in bird cycle
- *Cx.salinarius* - EEE, WN to humans

Aedes albopictus



Public Enemy # 1

Aedes albopictus aka Asian Tiger Mosquito

- Demonstrated “Competent Vector” of WNV, EEE, LAC. . .
- Easy to Breed…Just add water
- Natural History is Different
  - Asynchronous breeding
  - Daytime biter
- Normal abatement methods (adulticiding) ineffective

Ochlerotatus japonicus

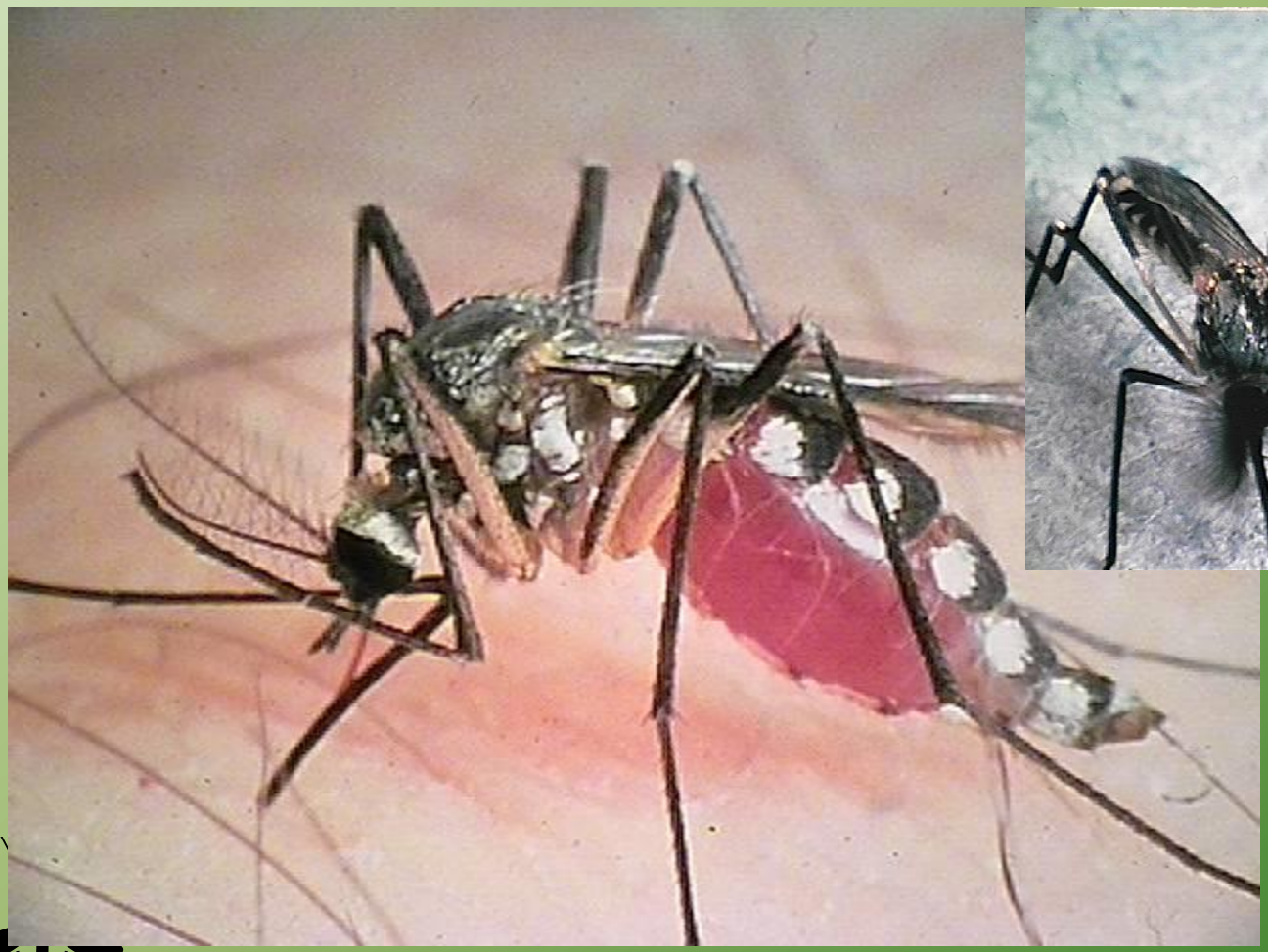
The Asian Bush Mosquito

ROCK POOLS

OCHLEROTATUS JAPONICUS
LARVAL HABITATS

-Rock pools
-Rock holes
-Bird baths
-Porcelain containers
-Concrete containers
-Catch basins
-Stone-earthenware
-Street gutters
-Tarps
-Tree holes
-Seepage depressions
-Barrels
-Metal cans
-Wheel barrows
-Buckets
-Plastic pipes
-Plastic dishes
-Plastic bottles
-Temp. ground water pools
-Tire ruts
-Used tires

Primary La Crosse Vector
Oc. triseriatus, Tree-hole Mosquito



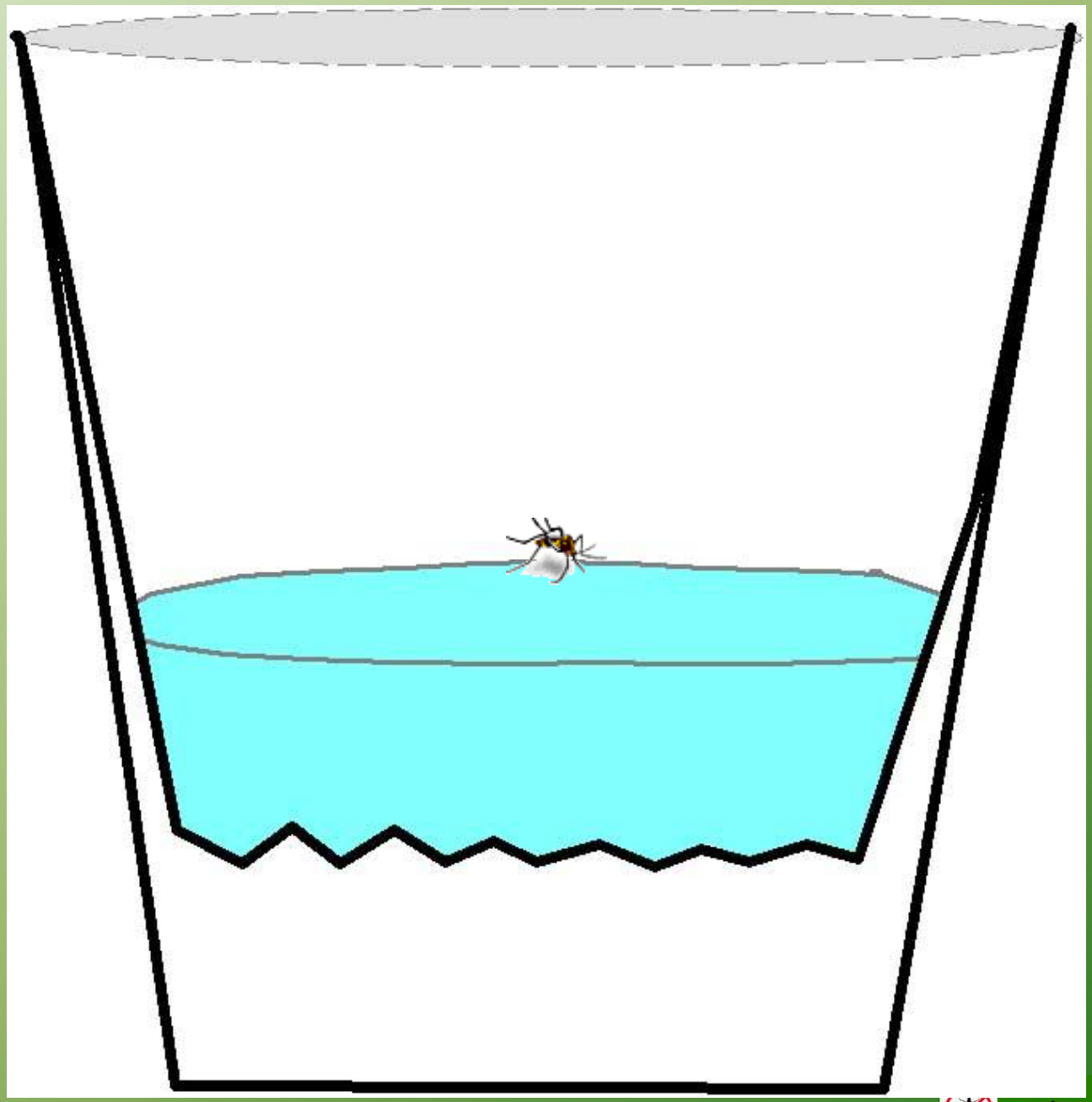
Habitat: Tree Holes

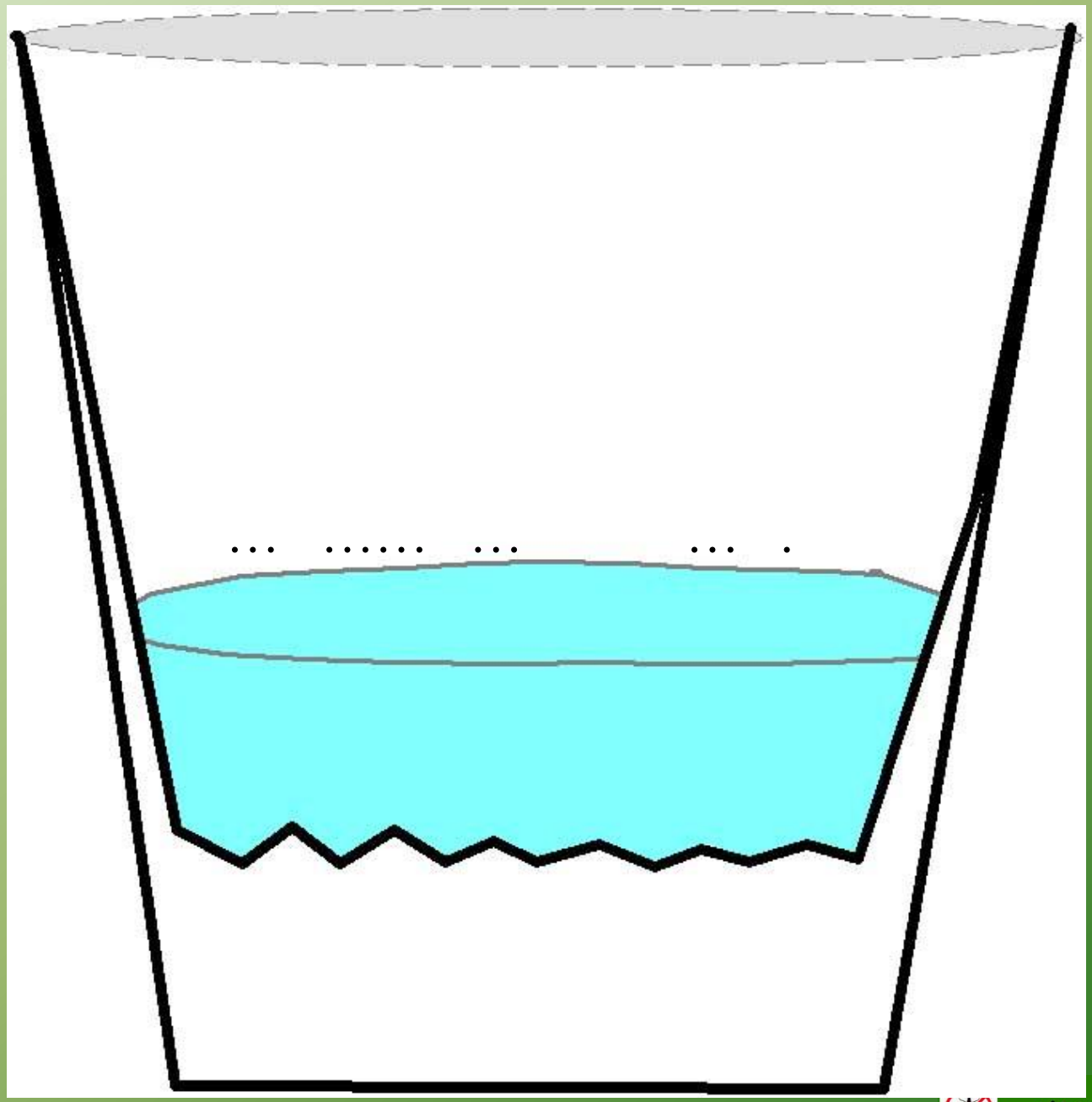
LIKE *AE. ALBOPICTUS* AND *OC. TRISERIATUS*, THIS IS ALSO LOVE AT FIRST SIGHT FOR *OC. JAPONICUS*

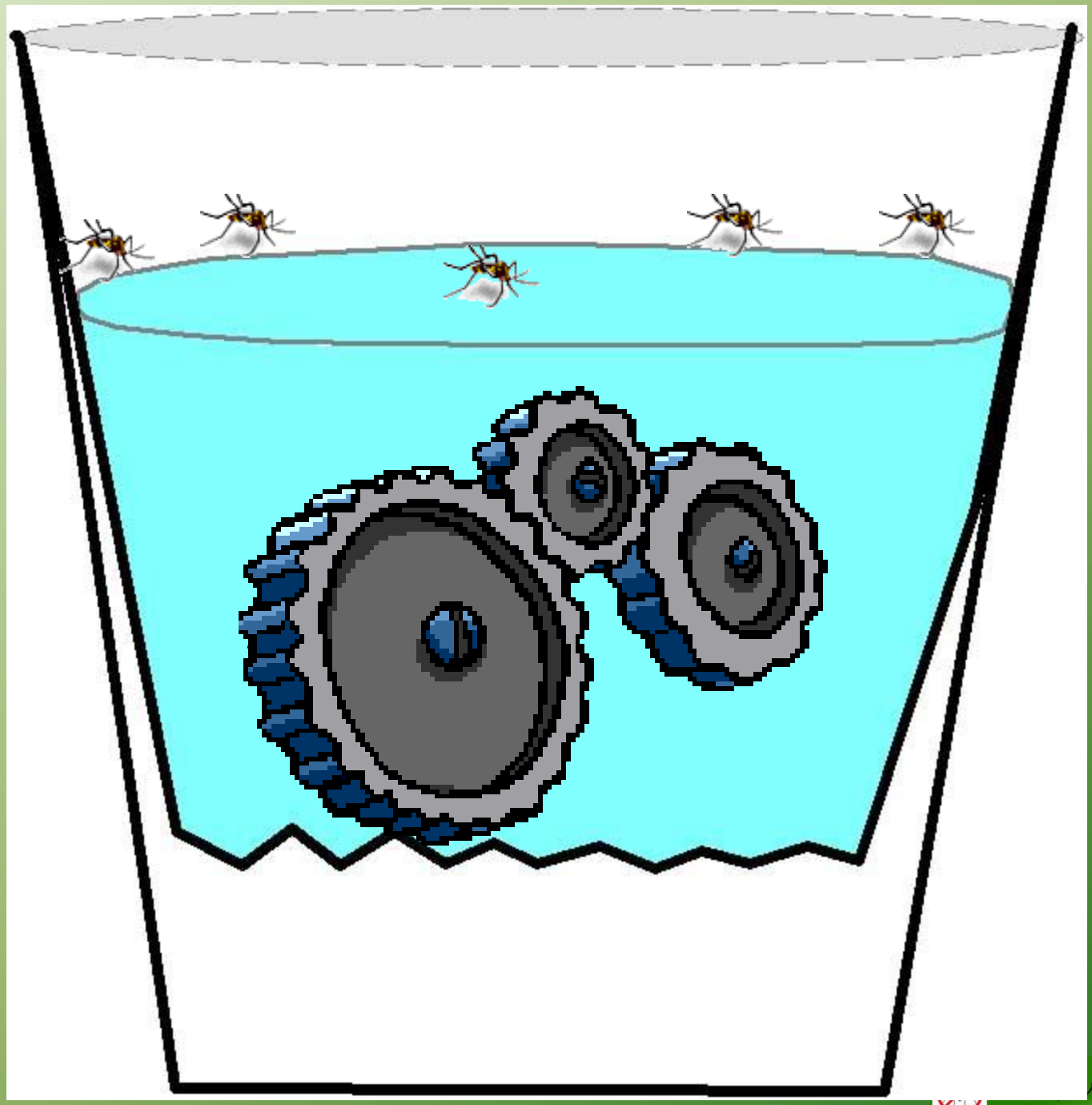
OFTEN OVERLOOKED CONTAINERS

SOME MOSQUITO LARVAL HABITATS IN ARTIFICIAL AND NATURAL CONTAINERS AROUND THE HOUSE

- Buckets, cans, bottles, jars, jar lids, cups
- Children's plastic toys
- Swimming/wadding pools
- Tires, Hubcaps
- Wagons, wheel barrows,
- Flower pots and saucers, bird baths
- Blocked gutters, black plastic drain pipes
- Tarps over boats, wood pile, etc.
- Pet water bowls
- Boats, canoes,
- Hot tubs, rain barrels, trash cans
- Cement ponds, catch basins, sump pits, cisterns, pools
- Toilet bowls, refrigerators, freezers, junk autos,
- Natural containers: tree holes, root holes, plant axils, rock pools







CONTROLLING MOSQUITO LARVAE FOUND IN CONTAINERS

- It is easy to find and eliminate mosquito larvae in containers by the "TIP and TOSS" method
- If you want to keep the container, then turn it upside down, or flush the water once every 5-7 days (=TIP)
- Best to eliminate (take to land fill) as many containers as possible (=TOSS).

The WNV list gets longer each year

- There are at least 60 species that have been found positive for WNV in the U.S. at this time.
- These 60 can be found in many different kinds of habitats, and are not limited to cities, salt marshes, or wetlands. They can breed in city sewers, backyards, flooded woodland pools, or in any kind of pond, puddle or clogged gutter. Each location has problems of its own, and there doesn't seem to be any place that is exempt.
- Each town or county must have its own habitat and control information .

To reduce risk of disease

- Reducing “Risk” means stopping something **before it happens** Thus it is essential to “Profile” the agent of disease. In our case targeting mosquitoes for control is the essential preventive measure to stop the spread of the agent.
- “Prevention” is the key to reducing disease, not “Treatment”
- “No disease has ever been eradicated by treatment, only by “Prevention” – Dr. George Dudney

WNV Prevention Programs

- Modern mosquito management includes:
- Prevention of disease through mosquito POPULATION management. It is not easy to find habitat, eliminate breeding, control larvae, or have to spray for adult mosquitoes when the mosquito population is huge. PLAN AHEAD!

PROTECTING YOURSELF AND OTHERS FROM MOSQUITO-BORNE ARBOVIRUSES

1. Reduce mosquito problems around your house by tossing or emptying water containers
2. Take notice of mosquitoes and do not let them bite you
3. Avoid going to or staying in areas with high mosquito numbers
4. If you must go into such areas protect yourself by:
   a. passing through quickly
   b. wear long sleeves and long pants
   c. wear mosquito repellent: DEET is best, follow label directions
5. Pass this info. on to others, especially the young, elderly, and immune deficit individuals