

MOSQUITOES!

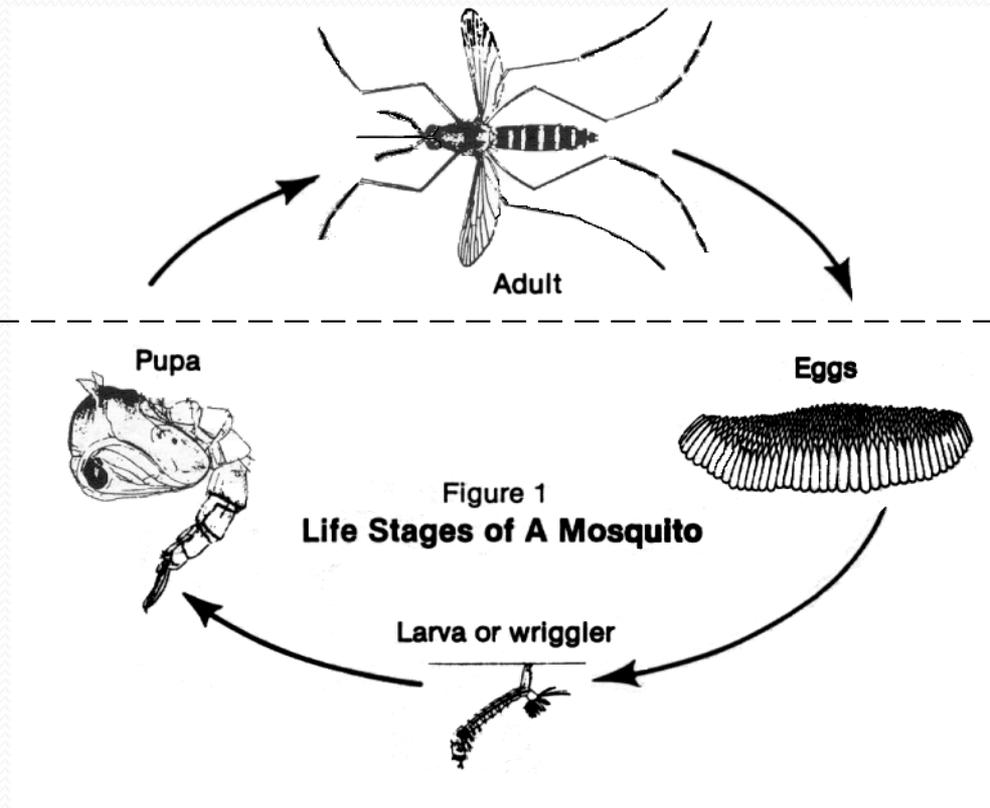
Their Biology and Ecology

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Mosquito Biology

- 60- plus species in Maryland in 10 genera
 - 10 or more can vector disease
 - Many cause annoyance problems
- Many different habits and habitat requirements
- Quick life cycle; many generations per season

Mosquito Life Cycle



All stages below the dotted line are aquatic

Complete Metamorphosis

Eggs

- Laid either in rafts, or singly on water surface or on dry ground



Culex laying egg raft



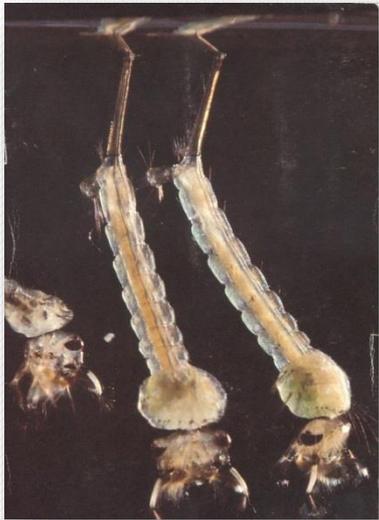
Egg rafts may contain up to 300 eggs



Eggs laid singly,
Aedes or
Ochlerotatus

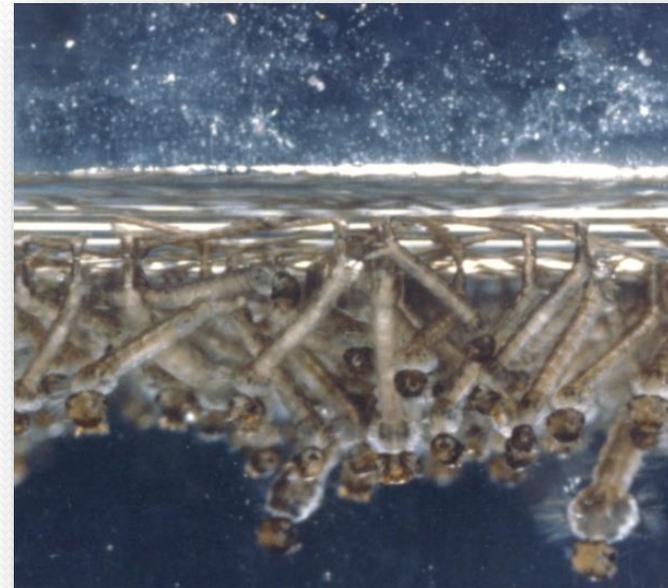
Larvae

- Must live in water
- Must breathe air, usually at the water surface
- Very active; light- and movement-sensitive



Notice the long siphon tubes on these larvae, probably Culex

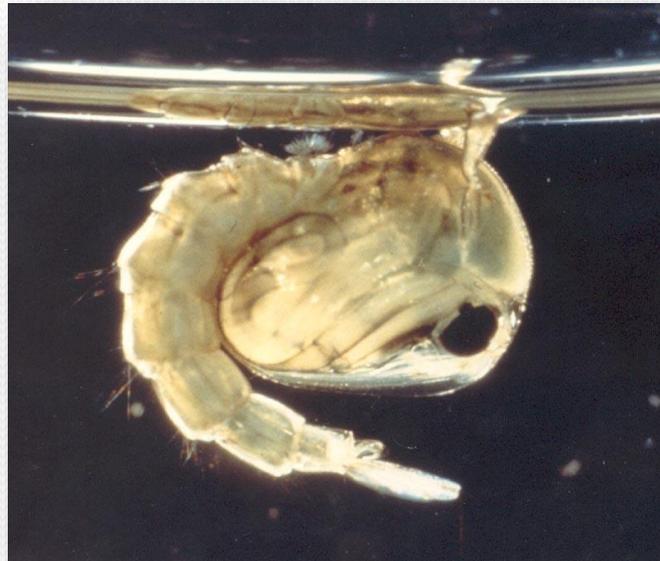
Some species' larvae will congregate together in a 'knot' or 'ball' in their breeding habitat



Anopheles larvae lack a siphon tube

Pupae

- The 'resting' stage - undergoing their complete transformation into the flying adult
- Very active - tumble through the water when disturbed
- Must breathe air, usually at the water surface
- Do not feed!



Adults

- Both male and female feed on nectar or plant juices - energy for flight
- Only females bite - need blood (protein) for egg development
- Wide variety of flight ranges, host preferences and habitats



Ochlerotatus bloodfeeding - notice her pointed abdomen

Aedes albopictus, the Asian tiger mosquito



Anopheles feeding - notice the 'headstand' position she takes

Where To Lay Eggs...

Just a sampling of potential
egg-laying habitat



Mosquito Habits

- Flight Range



Aedes albopictus - less than 200 yards
The Asian tiger mosquito



Culex and Anopheles - 1 to 2 miles



Ochlerotatus , various - 5 to 50 miles

SURVEILLANCE METHODS

LARVAL

Larval Dipping



Sieving



Pipette

ADULT



BG Sentinel traps



CDC light traps



Gravid traps

Landing Counts



Mosquito-Borne Diseases in MD

Endemic Diseases in Maryland

- Eastern Equine Encephalitis
- West Nile virus
- St. Louis Encephalitis
- Dog Heartworm

Possible imported diseases:

- Chikungunya virus (Caribbean, C. & S. America)
- Zika virus (C. & S. America)

Container-breeding Aedes

- Bite anytime of day
- Interrupted feeding
- Hard to treat - must have access to private property
- Do not come to standard CDC traps - need BG Sentinel traps
- Readily enter homes & cars

Culex

- Bite mainly at dusk & dawn
- Not skittish biters
- Often in water on public property; can also utilize containers
- Readily come to baited CDC traps.
- Do not readily enter homes

The Trouble With Tigers



- *Aedes albopictus* introduced into Maryland in 1987
- Closely associated with human habitation - develops only in bamboo shoots, treeholes & containers
- Capable vector of several diseases, including WNV and Zika
- Incredibly annoying
 - Bites mainly during the day, unlike most of our species
 - Readily enters homes, cars, etc
 - Very persistent and aggressive biter
 - Difficult to eliminate unless egg-laying containers are eliminated
 - Many homeowners stop using their yards once this species is established

Tiger Larval Habitats

Any Of These Places Hold Enough Water To Support Tiger Populations



More Tiger Habitats



Still More Tiger Habitat



Even More Tiger Habitat





Aedes aegypti females



Lethal Ovitrap



WHAT HOMEOWNERS CAN DO:

- Check yard weekly and tip or remove any water holding containers
- Talk to neighbors about "tiger" breeding areas - problem cannot be fixed by cleaning only one yard
- Work with community officials to educate whole community about "tigers"





Homeowners can use these products in their own yards to treat water in containers. Mosquito Dunks (left) and Mosquito Torpedoes (right) are both available commercially.

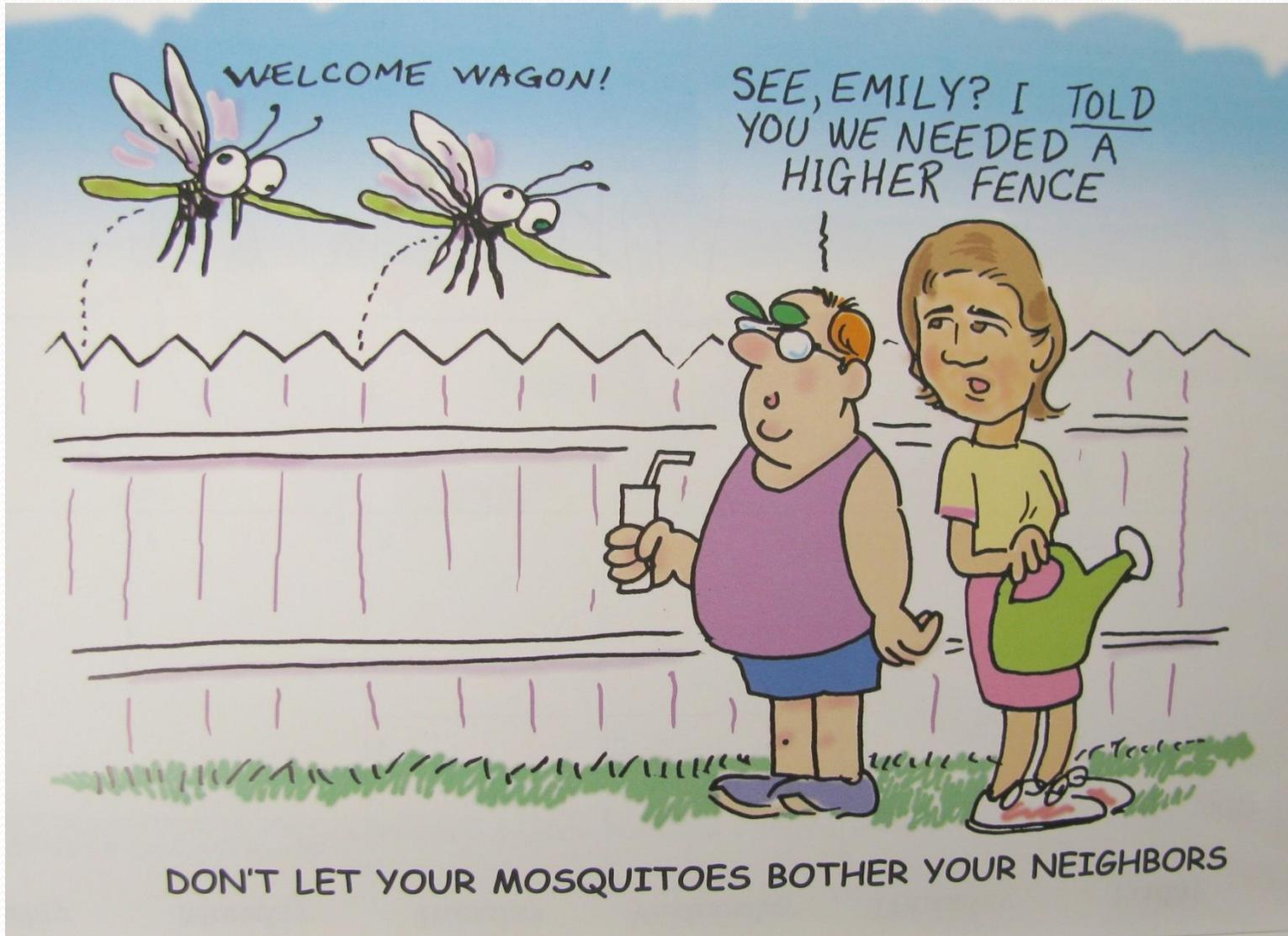


WHAT COMMUNITIES CAN DO:

- **Volunteers** - distributing information or doing yard inspections; church groups, scouts, HS students
- **Organize community clean-ups:** help elderly clean gutters/yards; arrange tire pick-up
- **Newsletters** - put information in anything going to homeowners
- **Display booth** - we have exhibits we can lend
- **Stock ponds** - ornamental ponds can be stocked with mosquito-eating fish
- **Covenants/Codes** - put something in codes about creating mosquito nuisance and ENFORCE it!

WHAT AGENCIES CAN DO:

- Inspect yards to find 'tiger' breeding areas.
- Educate the homeowner on methods for eliminating mosquito breeding.
- Leave a door hanger if the resident is not home.
- If inspecting a yard, it's always good to look at neighboring properties (or better yet, get permission to inspect there too).
- Public Education - workshops, talks, games, exhibits, flyers & bookmarks.



Cartoon courtesy of Fairfax County Health Department

QUESTIONS?

Contact Information for MDA Mosquito Control offices:

- Baltimore, Harford counties: 443-875-9551
- Prince George's, Montgomery, Howard, western MD counties: 301-422-5080
- Anne Arundel : 410-841-5870
- Southern Maryland: 301-373-4263
- Eastern Shore: 410-543-6626