Invasive Aedes Mosquitoes in California

Megan Sebay, MPH
San Mateo County MVCD
Basic Mosquito Biology
Invasive Aedes Mosquito Species in California

Aedes notoscriptus

Aedes aegypti

Aedes albopictus

Photo: OCMVCD

Photo: CDC

Photo: CDC
Aedes aegypti

Yellow Fever Mosquito

- Small
- Dark-colored
- Banded legs
- ‘lyre-shaped’ marking on thorax
- Ankle-biter
- Strongly prefers humans
- Currently found in southern CA & central valley
Aedes albopictus
Asian Tiger Mosquito

- Small
- Dark-colored
- Banded legs
- Bright white stripe on thorax
- Currently found in southern CA
Aedes notoscriptus
“Aussie Mozzie”

- Small
- Dark-colored
- Banded legs
- Looks a lot like aegypti
- Much more limited distribution in CA
- Vectors different set of diseases
Invasive Aedes

Aedes notoscriptus, Aedes albopictus, Aedes aegypti

Photo from San Gabriel Valley MVCD (https://www.sgvmosquito.org/)
Mosquito Ecology

Invasive Aedes
- Daytime biting
- Container breeders; don’t need much water
- VERY aggressive biters
- Breed indoors
- Extremely challenging to control
- Eggs can survive desiccation
- New disease threats

‘regular’ mosquitoes
- Mostly dawn/dusk biting
- Breed in marshes, creeks, stormwater system, containers, anywhere with water
- Not so aggressive
- Rarely breed indoors
- Under control with existing methods
- Can destroy eggs by dumping out
- Transmit disease
The World's Deadliest Animals
Number of people killed by animals per year

- Mosquito: 725,000
- Human: 475,000
- Snake: 50,000
- Dog: 25,000
- Tsetse fly (sleeping sickness): 10,000
- Assassin bug (Chagas disease): 10,000
- Freshwater snail (schistosomiasis): 10,000

- Ascaris roundworm: 2,500
- Tapeworm: 2,000
- Crocodile: 1,000
- Hippopotamus: 500
- Elephant: 100
- Lion: 100
- Wolf: 10
- Shark: 10

Source: Gatesnotes
West Nile Virus in California

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Chikungunya in the Americas

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Chikungunya in California

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Dengue in the Americas

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Dengue in California

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Zika Virus in the Americas

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Zika Virus in California

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Yellow Fever in the Americas

Map from US Centers for Disease Control and Prevention (www.cdc.gov)
Risk of Mosquito-Borne Disease in the Bay Area

- Dengue: low
- Chikungunya: low
- Yellow fever: low
- Zika: low
- West Nile virus: moderate
Invasive Aedes Mosquito Species in the US

Source: CDC
Invasive Aedes Mosquito Species in the US

Counties where Aedes aegypti was reported between Jan. 1, 1995, and March 2016. Counties in yellow recorded one year of A. aegypti being present; those shown in orange recorded two years; and those shown in red, three or more years.

Centers for Disease Control and Prevention
March 2015
Invasive Aedes in California

September 2015
Risk of Reintroduction of Invasive Aedes
Invasive Aedes Detection Sites in Menlo Park
Keeping Invasive Aedes Out

- Don’t introduce plants or containers
- Check for eggs/larvae
- Eliminate breeding habitat
- Report suspected sightings

Photo from Orange County MVCD
Red Flags for Invasive Aedes

Appearance
- Small size
- Dark-colored or black body
- White striped/banded legs
- ‘lyre’ shape (aegypti) or stripe (albopictus) on thorax
- Just looks ‘different’ than usual mosquitoes

Behavior
- Daytime bites, especially in urban/suburban areas
- Biting indoors
- Very aggressive biting
- ‘ankle-biting’
If You Suspect Invasive Aedes:

- Catch or kill (without squashing!) for identification
- Note location, environment, date, and time of day
- Contact your local vector control district or ag department to report and provide sample
Why Can’t You Just Kill Them?

Photo from San Gabriel Valley MVCD, www.sgvmosquito.org
Traps for Invasive Aedes Surveillance

Ovicup

BG Sentinel

Autocidal Gravid Ovitrap (AGO)
Invasive Aedes Surveillance Locations
Physical Control

- Eliminate containers
- Clean up garbage and other debris
- Focus on permanent solutions – not just dumping out water
- Resident participation and cooperation required
Larviciding

- Bacterial larvicides
- Insect growth regulators
- Oils (BVA-2, etc.)
- Large-scale larvicide applications may be useful
Adult Mosquito Control
Communication Challenges

Aedes mosquito

Carries: Zika, Dengue, West Nile*

'80s mosquito

Carries: Rubik's cube, Swatch, Walkman

*Aedes can carry WNV but Culex mosquitoes are main carriers

@redpen blackpen
Beyond the 5 D’s

- Dump & drain standing water
- Dress in long pants and sleeves
- Stay inside at dusk & dawn
- Use a repellent containing DEET
- Defend your home with window screens
Plan Ahead

- Start the planning process NOW
- Consider resources and future needs
- Make cooperative agreements with neighboring jurisdictions
- Meet with your local mosquito/vector control agency
- Prepare the public for the arrival of invasive Aedes
Resources

▪ Surveillance and Control of Aedes aegypti and Aedes albopictus in the United States (CDC)

▪ Guidance for Surveillance of and Response to Invasive Aedes Mosquitoes and Dengue, Chikungunya, And Zika in California (CDPH)

▪ California Department of Public Health

▪ Your local mosquito and/or vector control district
Questions?

Me: don’t be weird at this social event
Other me: give strangers unnecessary information about bugs