

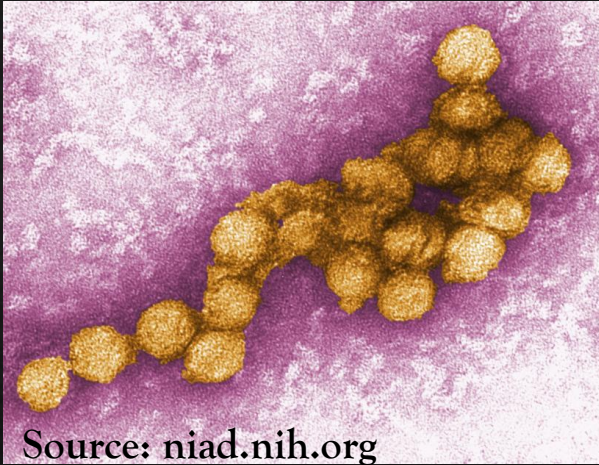
A surveillance study on *Culex* sp. in Southeast Kansas and detection of West Nile virus in the mosquito population

Sara Goins and Anuradha Ghosh

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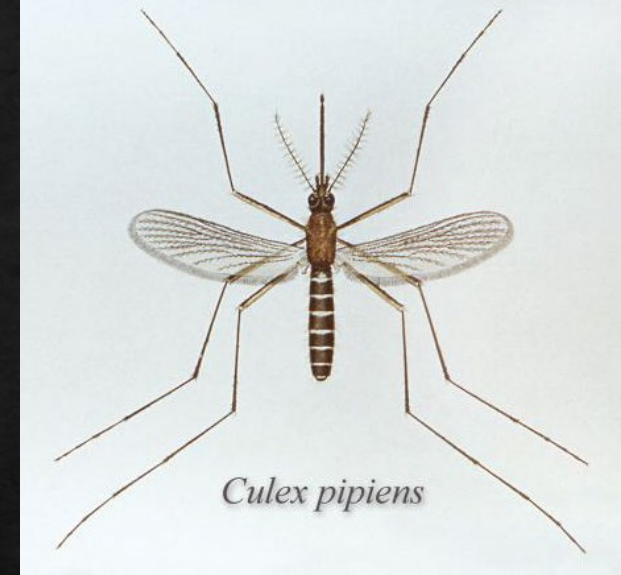
Background



Electron micrograph of WNV

- West Nile
Neuroinvasive
Disease (WNND)
- Symptoms
- Treatment

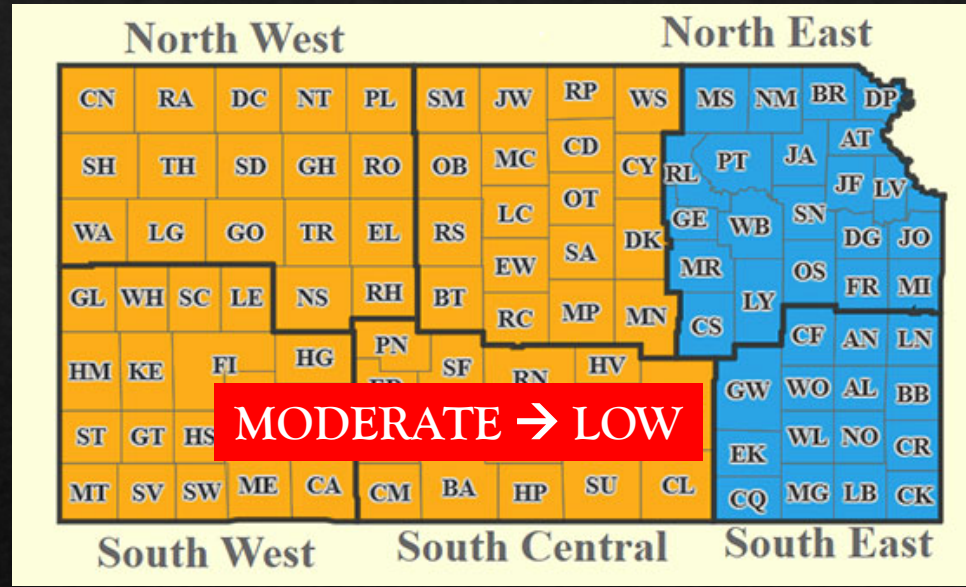
WNV infection & symptoms section (WHO):
www.who.int/news-room/fact-sheets/detail/west-nile-virus



- Vector
- Natural host
(reservoir)
- Dead-end host

CDC Cycle of WNV transmission cycle:
www.cdc.gov/westnile/transmission/index.html

Background



Kansas Department of Health & Environment (KDHE) risk map and corresponding information [source: kdheks.gov]

Year	Total cases	WNND cases	Non-WNND Cases
2017	27	11	16
2018	47	23	24
2019	9	4	5
2020 (June 6)	2	1	1

Human WNV cases in Kansas: www.kdheks.gov/epi/download/All_Disease_Counts_Summary_2018.pdf

Goals

- Surveillance of *Culex* sp. around the year in SEK
- Detection of WNV in *Culex* population

Methods

- ◇ Water sample analysis
- ◇ Trapping: CDC light and gravid traps
- ◇ Lab work: Species ID, RNA extraction and real-time PCR

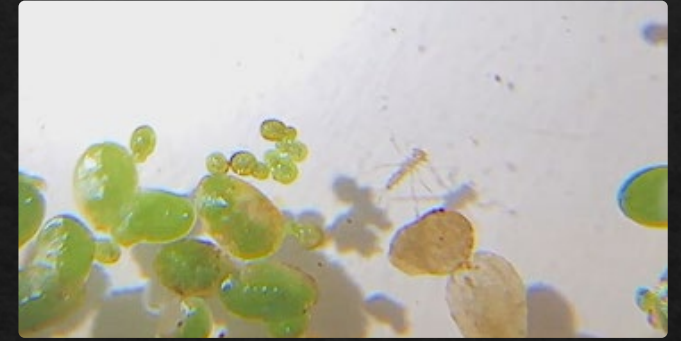
Water sample analysis



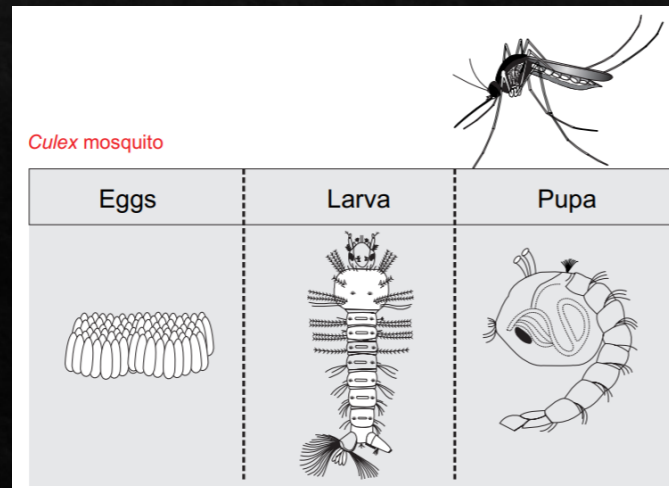
Water samples
collected from pits
and ponds

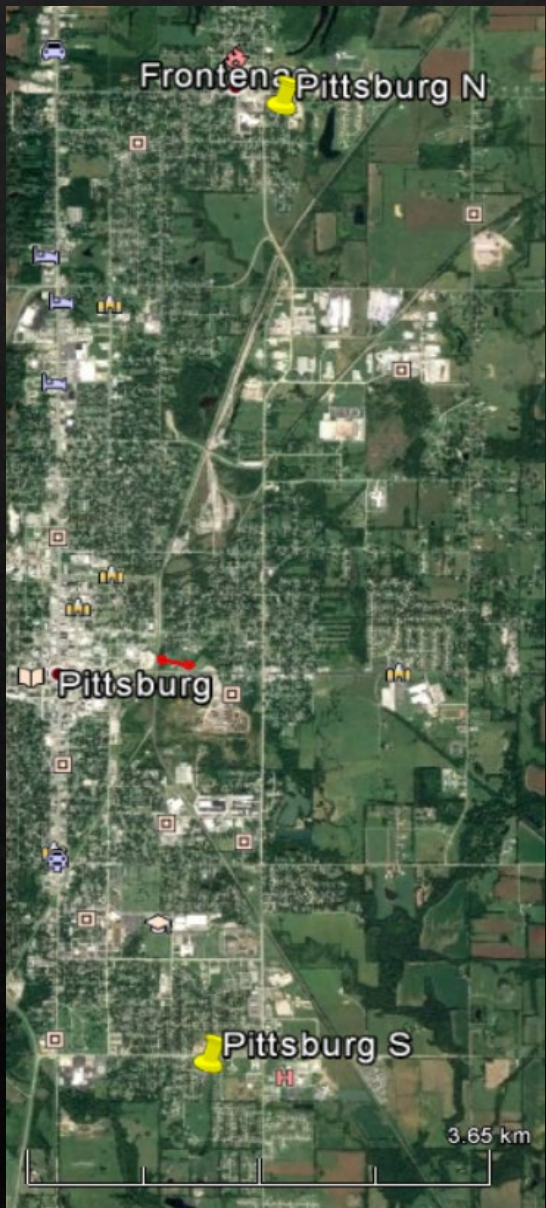


Analyzed for life-stages
of mosquito and
macroinvertebrates



Outcomes of analysis
was not conclusive to
determine water quality





Map of *Culex* sp.
surveillance locations

Trapping techniques

- Gravid traps (with stink water) were set up at two distant (7.5 miles) locations in southeast KS: designated Pittsburg N & Pittsburg S
- Traps were set overnight (Aug – Oct 2020) following CDC protocol



CDC light traps set up previously had very low success in trapping mosquitoes

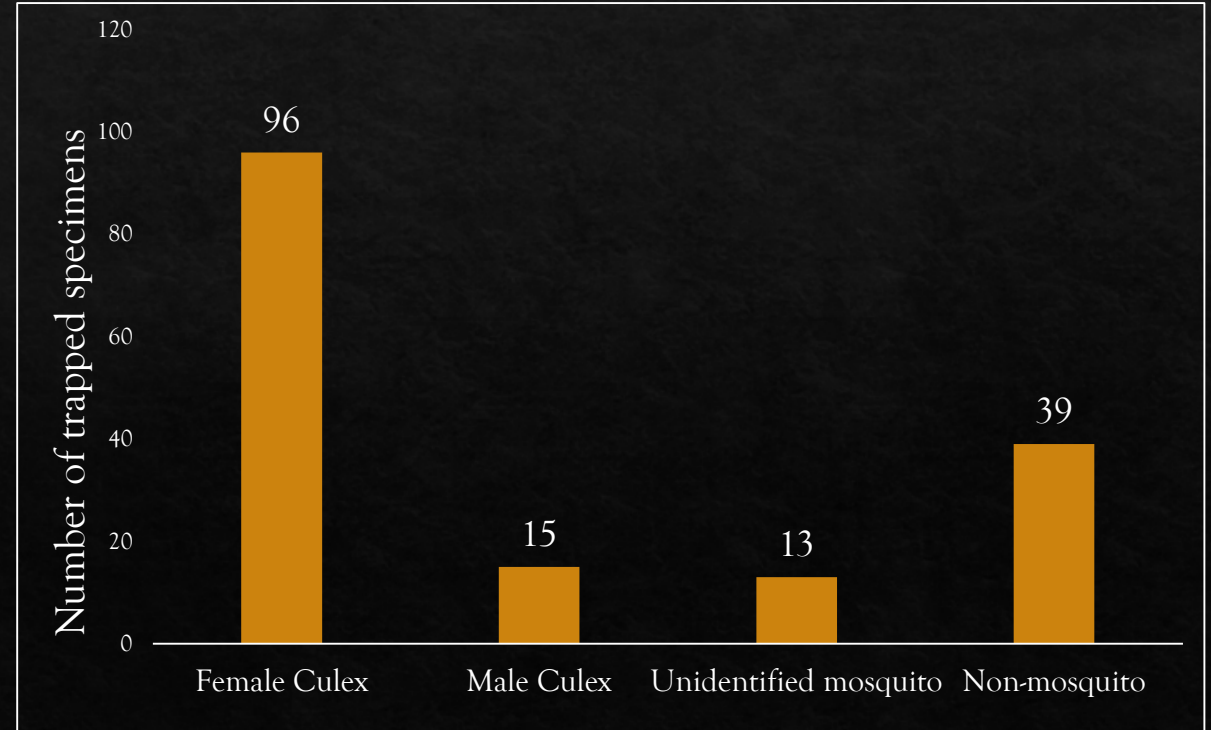
Preliminary surveillance data



Trapped specimens were frozen at -20° C and were identified following Mosquito general ID key: APHC TG 371. June 2016 using dissectoscope

Total 96 female *Culex* sp. were trapped out of total 32 trapping events. Some specimens were identified as black fly and others were unidentified.

CDC gravid traps were very efficient in terms of trapping female *Culex* sp.



Ongoing and future work

- More trapping throughout various seasons using gravid traps
- RNA will be extracted using a viral RNA kit from individual or pooled female *Culex* sp.
- The NS5, envelope and NS5 partial 3'UTR regions will be amplified using flavivirus consensus or West Nile specific primers to detect viral load
- *Genotypic comparison*: amplified viral genes will be sequenced and compared with existing NCBI database sequences
- *Statistical analysis*: R-statistical software will show presence and absence of WNV among collected mosquitoes



Outcome of the study

This study will provide unique information about viral load in *Culex* sp. mosquito vectors as well as seasonal testing will detect any temporal changes in the viral load.

Thank you

