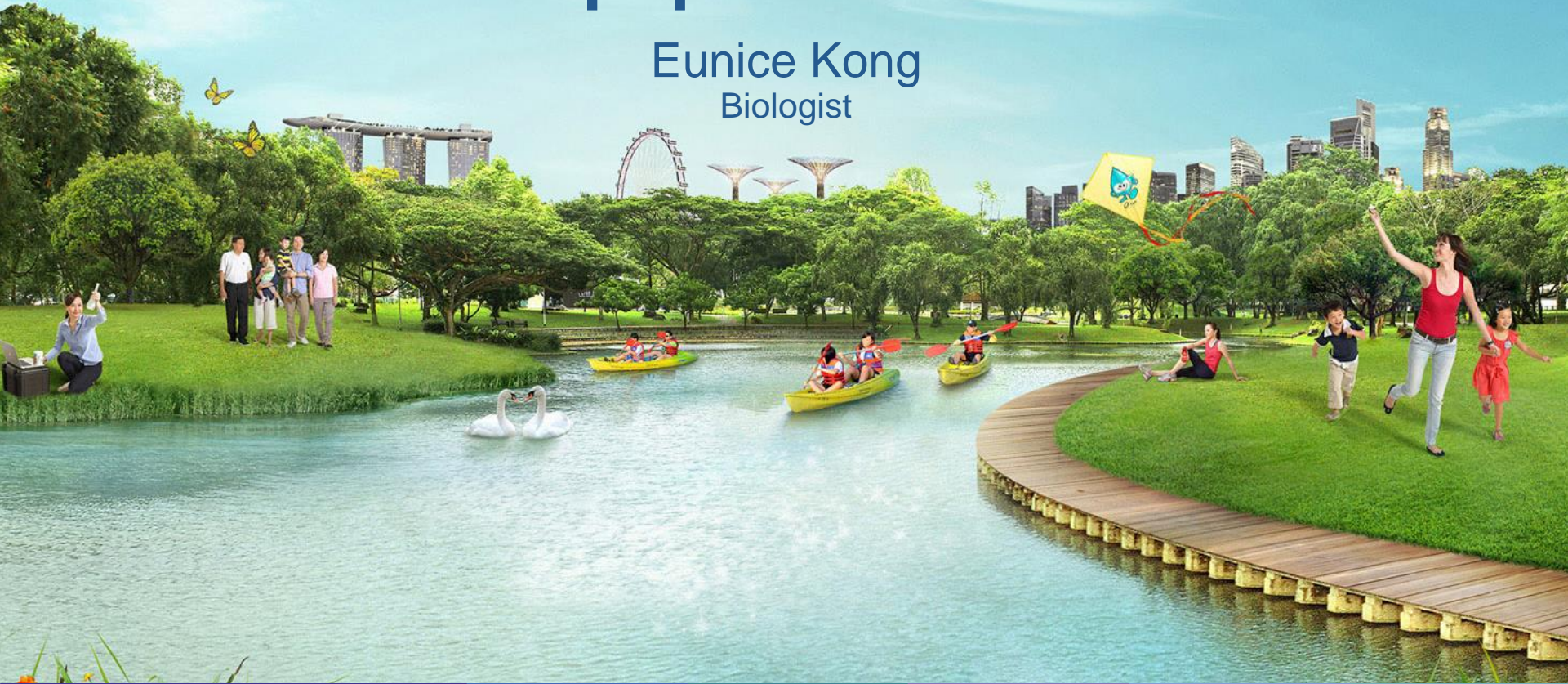


Automated identification and enumeration of midge populations

Eunice Kong
Biologist



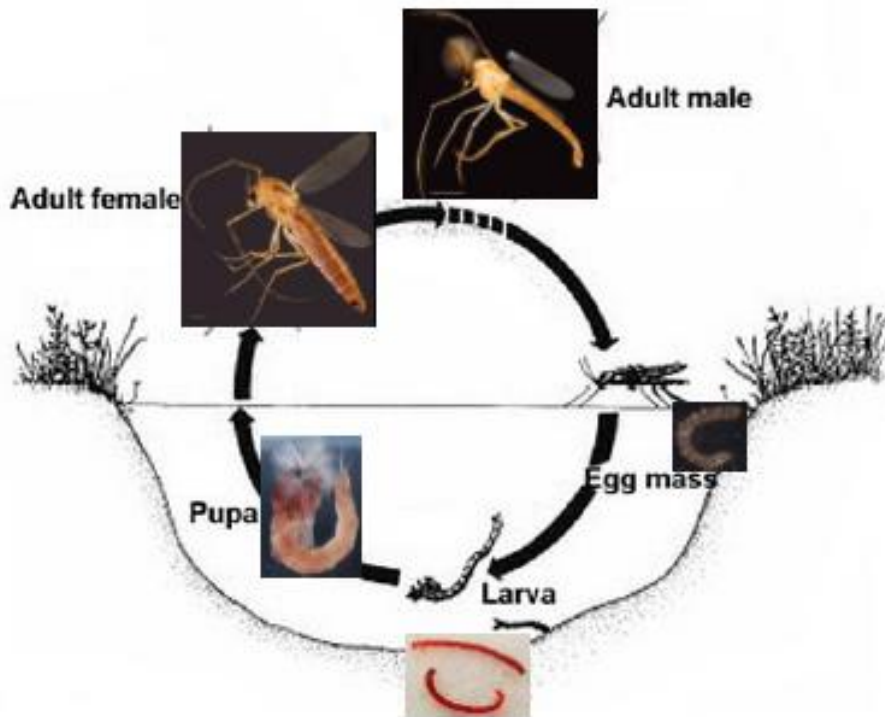
What are midges?

- Also known as Chironomids
- In Singapore, there are approximately 57 species, with over 5,000 species recorded globally.
- Commonly mistaken for mosquitoes.
- Midges neither bite nor transmit diseases.
- Occurs naturally in aquatic ecosystems (e.g. Lakes, ponds, waterways and reservoirs) where they are food for a variety of animals.



Life Cycle of midges

- Midges have 4 stages in their life-cycle – egg, larva, pupa and adult.
- First 3 stages are in water (1 –2 weeks), ending with a short flying adult stage (2-3 days)
- At times, adults may emerge in large numbers and are attracted to light, causing a nuisance to nearby residential estates and business establishments



Large number of midges observed at a HDB block near Pandan Reservoir in 2019

Current monitoring measures

- At the larval stage: Sediment grab-sampling
 - Facilitates a more targeted approach in our midge control measures
 - Tedious and difficult to distinguish midge larvae from other aquatic worms due to similar appearances



1. Collection of reservoir sediments using Ekman Grab Sampler



2. Sorting of sediments to find midge larvae

Hard to differentiate:



Midge larvae



Oligochaete worm

Current monitoring measures

- At the adult stage: Deployment of emergence traps at reservoirs
 - Adults emerging from areas near the trap will be collected.
 - Midge samples inside trap will be collected the next day, and will be sorted and counted according to species.
 - A labour-intensive process, especially when the traps contain large number of midge samples.



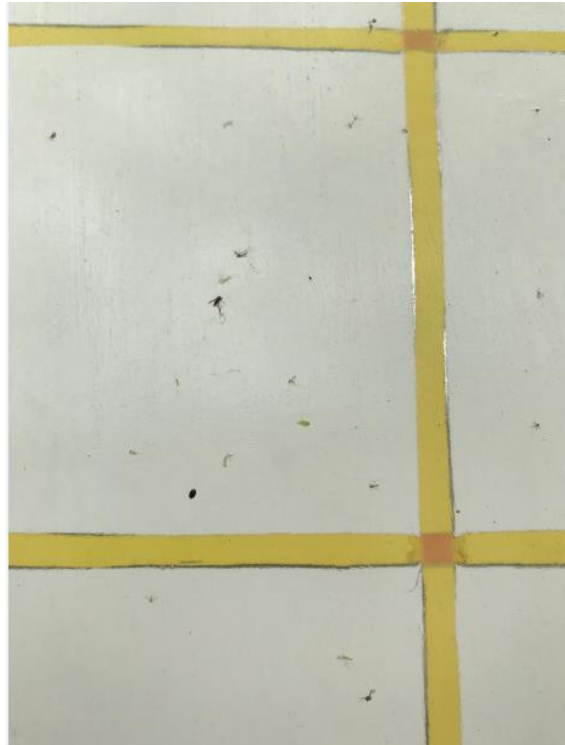
Emergence trap



Large number of midges make processing samples tedious!

Current monitoring measures

- At the adult stage: Oily board monitoring
 - Multiple oily boards are placed around reservoirs and waterways.
 - Adults trapped on the board are counted.
 - Provides a gauge of the midge situation, but is extremely time-consuming.
 - Person looking through may mis-identify other insects as midges.



Challenge Statement

- Current monitoring methods are time-consuming and labour-intensive.
- We seek a solution that will make the process of sorting, species identification, counting of midge larvae and adults more automated and accurate.
- In addition, solution should also be:
 - Provide a summary of the results (eg. percentage of each midge sp.)
 - Easy to set-up and use
 - Easy to maintain

Thank You

