The impact of pomelo peel on *Aedes albopictus* larvae

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2024/2/2

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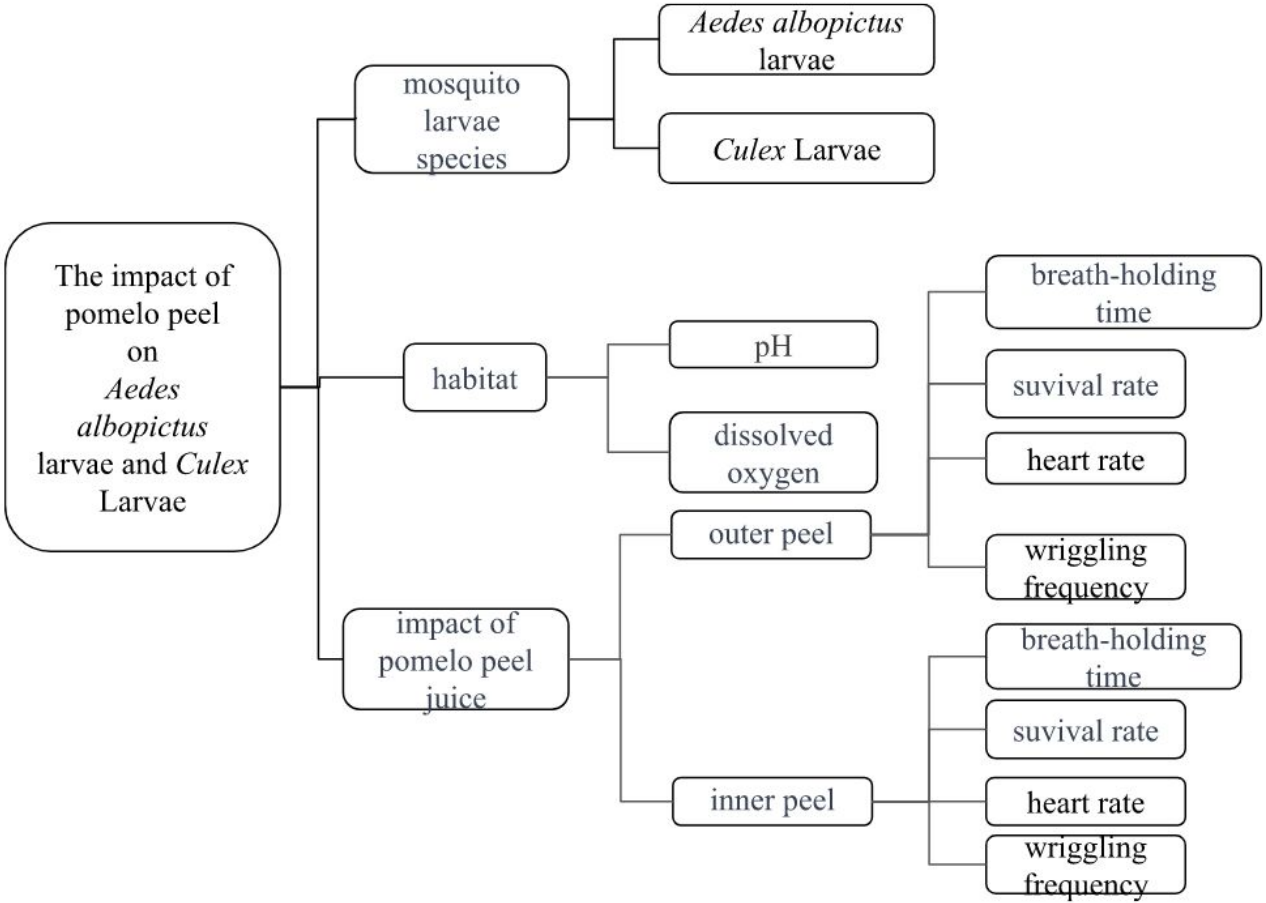
Introduction

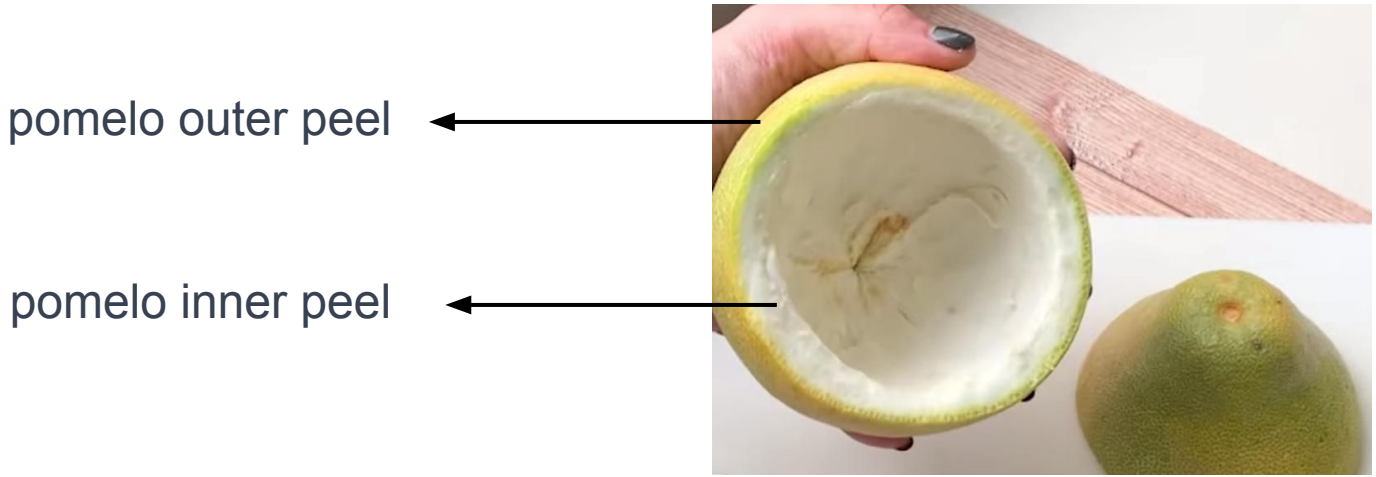
Mid-Autumn Festival is a traditional Chinese holiday characterized by family reunions and moon appreciation. It is also a season of abundant pomelos, which are believed to have mosquito-repelling properties. We are curious about the actual efficacy of pomelos in repelling mosquitoes.

Research outline



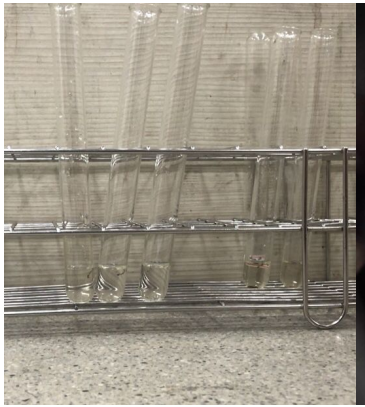
5.Preparing different concentrations of pomelo peel juice

Prepare 10g of pomelo peel (outer/inner peel) with 100ml of water in a juicer, resulting in a solution with a concentration of 9%. Dilute to different concentrations of pomelo peel juice and add them to test tubes containing mosquito larvae.



6.Measure the breath-holding time, survival rate, heart rate, and wriggling rate of mosquito larvae

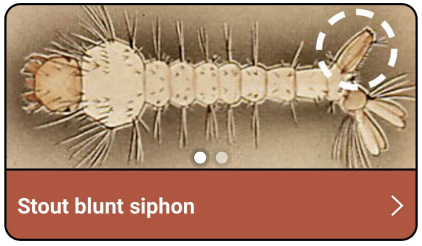
a. Breath-holding time: Calculate the duration it takes for larvae to submerge, remain without breathing, and resurface.
b. Survival rate: Observe the percentage of survivors after the experiment.
c. Heart rate: Measure the number of heartbeats per second under microscope.
d. Wriggling frequency: Count the number of times the tail touches the head within ten seconds.

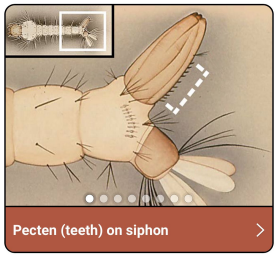


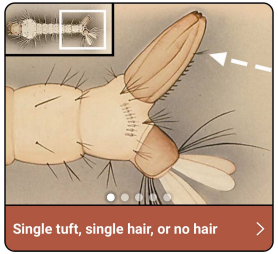
Experimental results

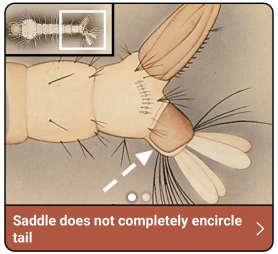
1. We found 126 *Aedes albopictus* larvae and 56 *Culex* larvae using the Globe Observer App
2. The pH (7.6-8.9) and dissolved oxygen (7-9 mg/L) in habitat of Aedes albopictus larvae.

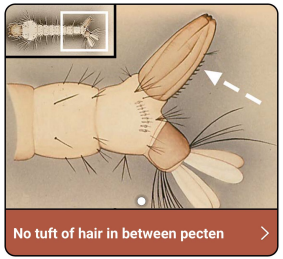
date	10/21-10/27	10/28-11/3	11/4-11/10	11/11-11/17	11/18-11/24
pH	8.93	8.22	7.66	7.61	8.02
dissolved oxygen (mg/L)	9mg/L	8mg/L	9mg/L	7mg/L	7mg/L

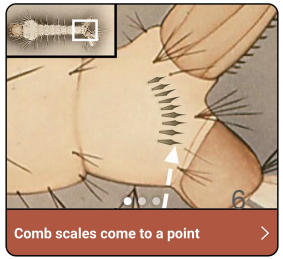






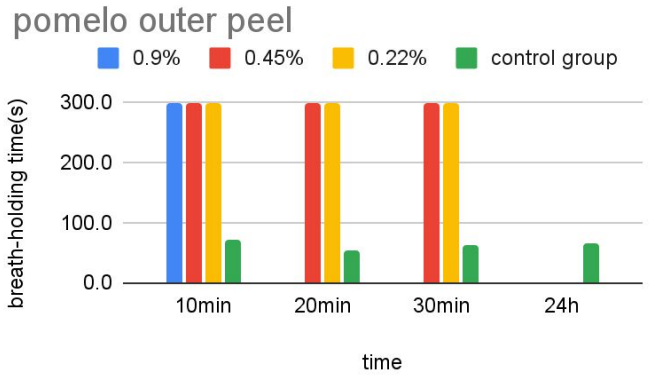


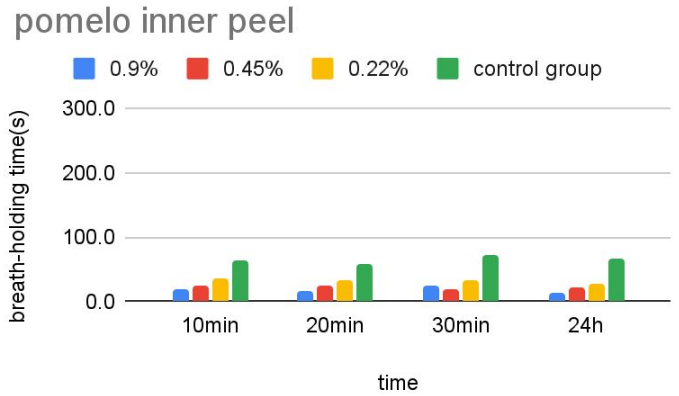




3.The impact of pomelo inner and outer peel juice on the **breath-holding time** of *Aedes albopictus*

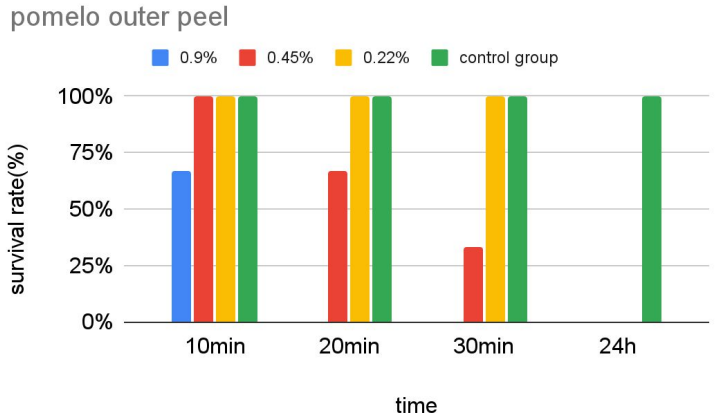
- Pomelo outer peel extends the breathing-holding time of larvae.
- Pomelo inner peel shorters the breathing-holding time of larvae.

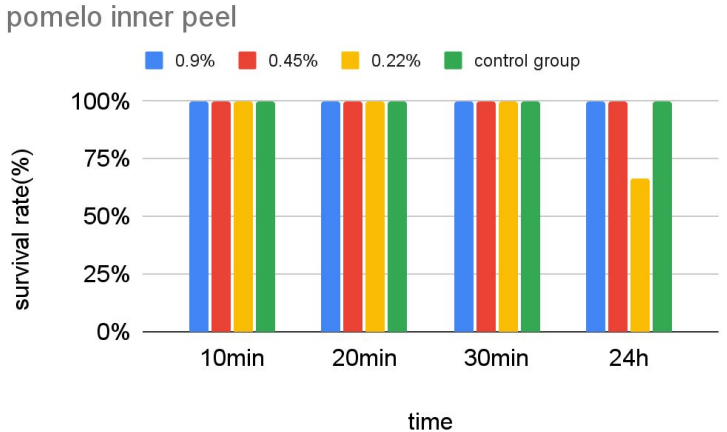




4.The impact of pomelo inner and outer peel juice on **survival rate** of *Aedes albopictus* larvae

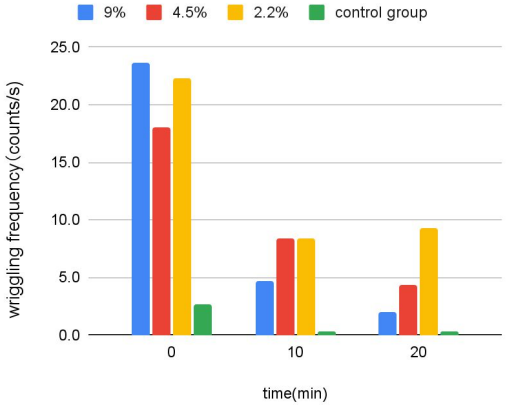
- The higher the concentration of pomelo outer peel juice, the lower the survival rate.
- The survival rate is not affected by the pomelo inner peel juice.

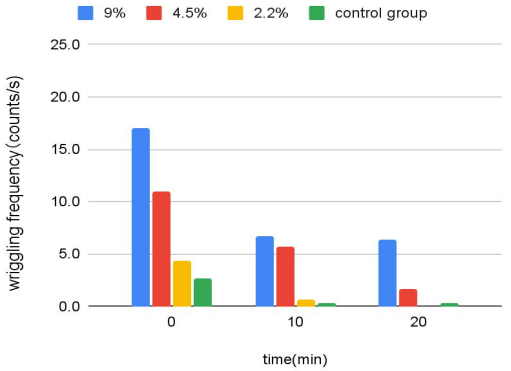




The influence of pomelo inner and outer peel juice on **wriggling frequency** of *Aedes albopictus* larvae

- The pomelo outer peel juice significantly increases the wriggling frequency.
- The pomelo inner peel juice significantly increases the wriggling frequency only at the beginning of experiment.

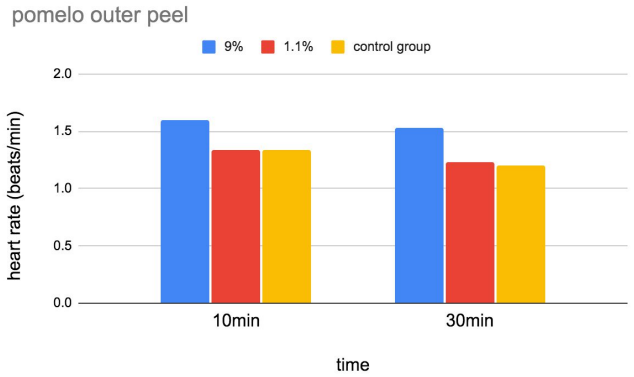


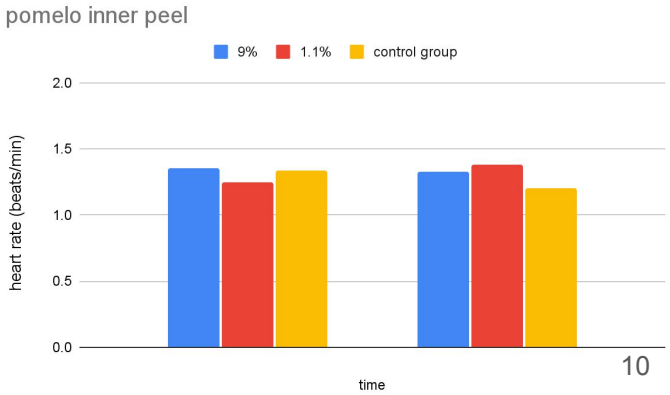


The influence of pomelo inner and outer peel juice on the **heart rate** of *Aedes albopictus* larvae

- The outer pomelo peel significantly increases the heartbeat frequency of *Aedes albopictus* larvae.

- The inner pomelo peel shows no significant impact on the heartbeat frequency.

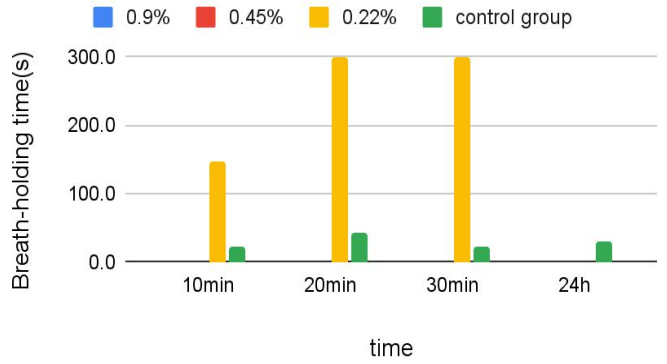


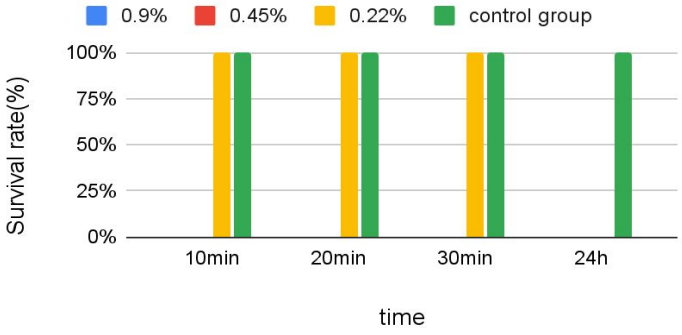


The influence of pomelo outer peel juice on the **breath-holding time** and **survival rate** of *Culex* larvae

- It can be observed that outer peel solution prolongs the breath-holding time of *Culex* larvae.

- It can be observed that all other *Culex* larvae treated with pomelo outer peel died within one day.





Conclusion

1. *Aedes albopictus* can be found in the vegetable gardens of New Taipei City, Taiwan, during November to December.

2. *Aedes albopictus* live in habitats with neutral pH and moderately high dissolved oxygen levels.

3. Pomelo outer peel have more impact on the *Aedes albopictus* larvae than inner peel.

4. Pomelo outer peel can increase the breath-holding time, heart rate, and wriggling frequency but decrease the survival rate.

5. *Aedes albopictus* exhibit a higher tolerance to pomelo peel compared to *Culex.*


Thank you for your listening