

Evidence of transovarial transmission of pathogenic and insect-specific viruses from field-collected mosquito species around two great Lakes in Kenya



Yvonne Ukamaka Ajamma^{1,2}, David Omondi Ouma¹, Thomas Ogao Onchuru¹, Daniel Ouso¹, Anne Muigai², Jandouwe Villinger¹ and Daniel Masiga¹

¹International Centre of Insect Physiology and Ecology, Nairobi, Kenya; ²Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya
yajamma@icipe.org

INTRODUCTION

Arboviruses implicated in viral related illnesses of both humans and animals have been isolated from mosquitoes in Kenya (Ochieng et al., 2013). A laboratory study reported that *Aedes aegypti* can maintain infective viruses by transovarial transmission for up to their seventh progeny (Joshi et al., 2002). Although epidemics of emerging infectious diseases have risen in frequency in recent years (Sang and Dunster et al., 2001), the possible contribution of the mosquito immatures in vertically maintaining viruses in circulation in the inter-epidemic periods has received little attention.

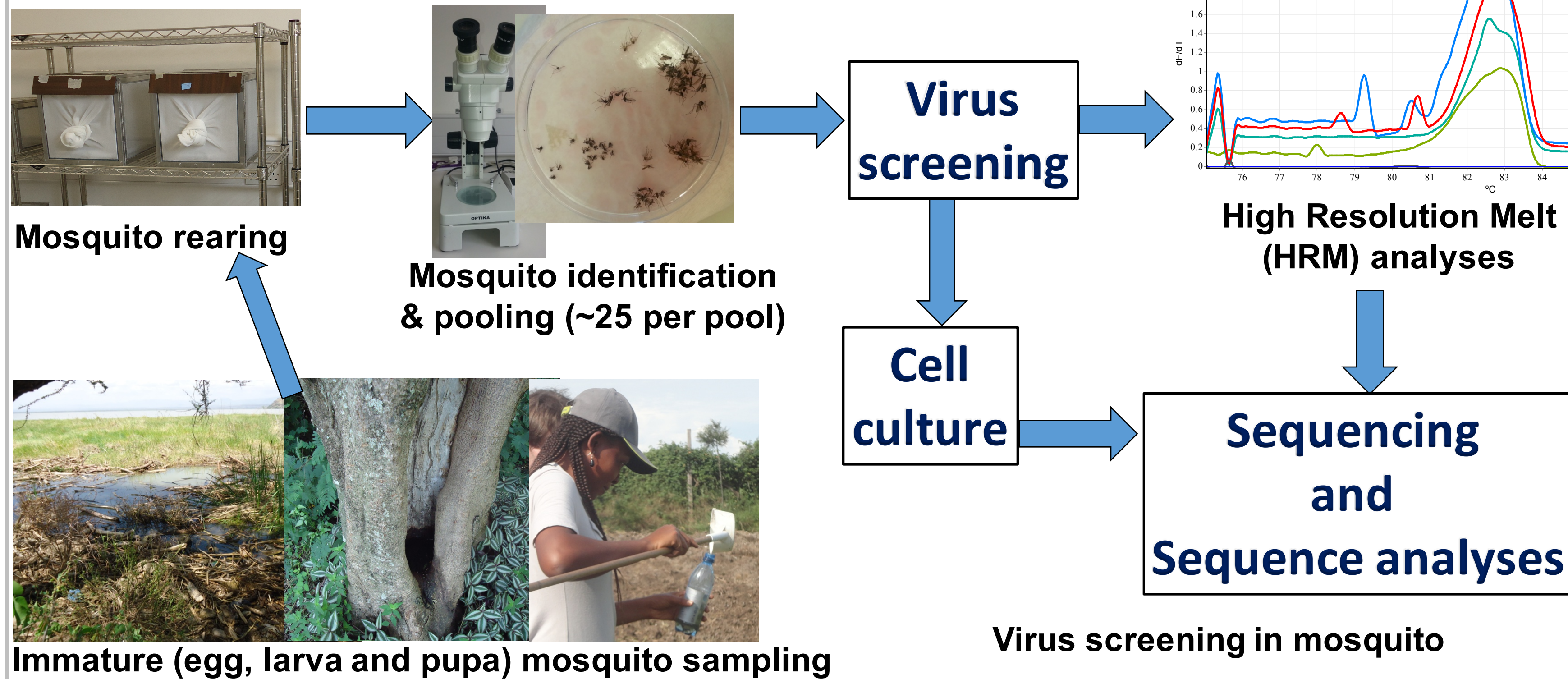
OBJECTIVES

This study was undertaken to investigate the occurrence of transovarial transmission of arboviruses of public health significance in different mosquito species in and around Lake Baringo in west-central Kenya, and Lake Victoria in western Kenya.



Figure 1. Map of study areas (circled).

METHODS



RESULTS

- 3 *Culex* species pools were positive for Bunyamwera virus via high resolution melting (HRM) analyses (Fig. 2) and cell culture (Table 1) from the Lake Victoria area.
- 16 pools of other mosquito species were positive for insect-specific viruses (Table 1) via HRM analyses.

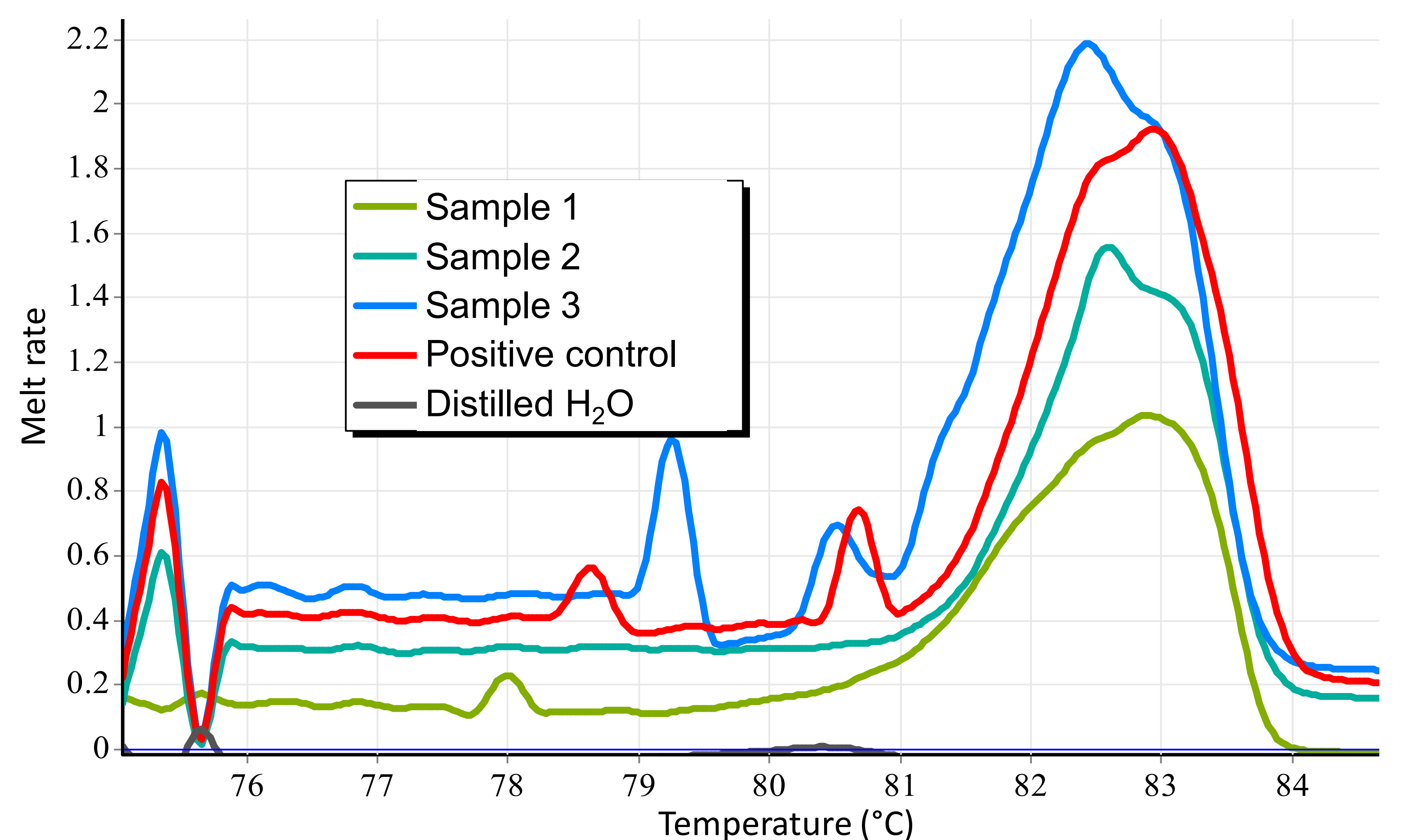


Figure 2. Melt rate (change in fluorescence/change in time) profiles of 3 mosquito pools positive for Bunyamwera virus.

IMPACT

- Bunyamwera virus is pathogenic and epidemiologically important.
- Knowledge of the mosquito vector and associated viruses will enable the application of informed and directed control strategy of these mosquitoes.
- Knowledge of the mosquito vector and associated viruses will enhance expected virus disease diagnosis and prevention in the affected areas.

CONCLUSION

- This surveillance information suggests that *Culex univittatus* is a vector and/or a reservoir of the pathogenic Bunyamwera virus, maintaining the virus in circulation without a vertebrate host.
- Knowledge of the breeding sites of these potential vectors can be used to forecast risk, and improve prevention and other vector management strategies.

Table 1. Non-pathogenic and pathogenic viruses isolated from field-collected and lab-reared mosquitoes of Lake Baringo and Lake Victoria areas of Kenya

Viruses detected	Lake Baringo mosquito pools	Lake Victoria mosquito pools
Cell fusing agent virus		<i>Aedes aegypti</i> (4 pools) <i>Aedes</i> sp. (1 pool) <i>Ae. luteocephalus</i> (1 pool)
<i>Anopheles flavivirus</i>	<i>Anopheles gambiae</i> (2 pools)	
Other insect-specific viruses		<i>Ae. luteocephalus</i> (3 pools) <i>Aedes</i> spp. (1 pool) <i>Cx. pipiens</i> (1 pool)
Bunyamwera virus		<i>Culex univittatus</i> (1 pool) <i>Culex</i> sp. (2 pools)

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