

Potential Vector in Equestrian Diseases Free Zone, Jakarta International Equestrian Park Pulomas Indonesia

Upik Kesumawati Hadi¹, Susi Soviana¹, Sugiarto², Isna Lailatur Rohmah¹, Fahmi Khairi¹

¹Entomology Laboratory, Division of Parasitology, Departement of Animal Infectious diseases and Veterinary Public Health, Faculty of Veterinary Medicine, Bogor Agricultural University, Jl Agatis Darmaga Bogor 16880.

²Vector Control Subdirektorat, Vector Borne and Zoonotic Diseases Control Directorate, Ministry of Health Republic Indonesia, Jl. Percetakan Negara No. 29, Jakarta Pusat

*Corresponding author's email: upikke@ipb.ac.id

Keywords: EDFZ, Jakarta, Mosquito, Potential Vector.

INTRODUCTION

In preparation of the equestrian competitions of the 18th Asian Games Jakarta, Indonesia has to set up an Equine Disease Free Zone (EDFZ) with a core zone at the Jakarta International Equestrian Park Pulomas (JIEPP) venue and a surrounding surveillance zone covering the area of DKI Jakarta and a protection zone covering Greater Jakarta (DGLAHS 2018). EDFZ is a horse disease free zone defined by OIE to hold horse racing competitions at the Asian Games and is only valid temporarily. Vector surveillance is one of the biosecurity requirement in the monitoring of progress of EDFZ in control and eradication for various diseases, such as mosquito borne diseases. There are several mosquito-borne viral diseases that cause varying levels of morbidity and mortality in humans and animals that can have substantial welfare and economic ramifications (Durand *et al.* 2013). Periodic collection of local mosquito species is essential to inform vector control strategies and track their impact on mosquito borne diseases (Chapman *et al.* 2016). The study was done to describe the potential vector species in core zone, the habitats, the fluctuation dynamics and the potential disease spread. The result of this study will benefit in contributing the development of strategies to monitor and manage the risk.

MATERIALS AND METHODS

The collection of mosquitoes was done biweekly from January to April 2018 in core zone of EDFZ, Pulomas Jakarta. 10 mosquito light traps were used to sample adults, and larvae were collected from water sources such as bathrooms, buckets, water dispensers, ditches, water control tanks, flower pots, bromeliads plants, fountain, and lakes. The collected samples were processed and identified according to the mosquito keys of O'Connor & Soepanto (1981), and finally analyzed.

RESULT AND DISCUSSION

The result showed that three species mosquitoes that are known to be capable of transmitting important arboviruses were collected, i.e. *Culex quinquefasciatus*, *Cx. tritaeniorhynchus*, and *Aedes aegypti*. The rate of mosquito hour density (MHD) of each mosquitoes was 0.98 mosquito/hour (*Cx. quinquefasciatus*), 0.15 mosquito/hour (*Cx. tritaeniorhynchus*), and 0.77 mosquito/hour (*Aedes aegypti*), respectively (Tabel 1). These values were higher than the vector standard value (> 0.025 mosquito/hour). The larval collection showed 3 species were found i.e. *Culex quinquefasciatus*, *Aedes aegypti* and *Armigeres* in 10 breeding places areas. The finding appeared that the highest larval density was showed in public bathrooms (71.4 larvae/dipper) followed by stagnant water in control tank (28.6 larvae/dipper) and bromeliad plants (24.3 larvae/pipet) (Tabel 2). These values were also higher than the larval standard value (> 1 larva/dipper). This study demonstrates that potential mosquito vectors of arboviruses (such as dengue, chikungunya, japanesse encephalitis) and lymphatic filariasis are present and may be abundant continuously on EDFZ.

CONCLUSION

Vector Surveillance System provide a cost effective means to combat vector borne disease emergence. Early vector control at larval stage was a critical point of the success of EDFZ programs in JIEPP Indonesia before equestrian competition.

ACKNOWLEDGMENTS

The research was supported by the Directorate General of Livestock and Animal Health Services (DGLAHS), Ministry of Agriculture, The Republic of Indonesia and Veterinary Services DKI Jakarta.

REFERENCES

- [1] [DGLAHS] Directorate General of Livestock and Animal Health Services Ministry of Agriculture of Indonesia. 2018. 18th Asian Games 2018 Equestrian Competitions Biosecurity Manual. Jakarta Indonesia. 24p
- [2] Durand, B., Lecollinet, S., Beck, C., Martínez-López, B., Balenghien, T. & Chevalier, V. 2013. Identification of Hotspots in the European Union for the Introduction of Four Zoonotic Arboviruses by Live Animal Trade. PLoS ONE 8, e70000.
- [3] Chapman G. E., Archer D., Torr S., Solomon T., Baylis. M. 2017. Potential vectors of equine arboviruses in the UK. Veterinaty Record. January 7 2017 doi: 10.1136/vr.103825.
- [4] O'Connor CT, Sopa T. 1981. A check list of the mosquito of Indonesia. *A special publication of NAMRU 2*. Jakarta. Indonesia.

Table 1. Mosquito hour densities during surveillance from January to April 2018 in core zone EDFZ Equestrian Venue Asian Games 2018 Pulomas-Jakarta

Surveillance periode	<i>Culex quinquefasciatus</i>		<i>Culex tritaeniorhynchus</i>		<i>Aedes aegypti</i>		Vector Standard Value Low<0.025 High>0.025 (Permenkes No 70, 2016)
	No.	MHD	No.	MHD	No.	MHD	
20-27 Jan 18	44	0.37	9	0.08	257	2.14	
10-11Feb 18	137	1.14	31	0.26	206	1.72	
24-25 Feb 18	56	0.47	15	0.13	134	1.12	
10-11Mar 18	189	1.58	0	0	20	0.17	
24-25Mar 18	73	0.61	0	0	14	0.12	
7-8 Apr 18	70	0.58	0	0	10	0.08	
21-22 Apr 18	260	2.17	0	0	7	0.06	

Note: MHD is mosquito hour density

Tabel 2. Rate of mosquito larval density during surveillance from January to April 2018 in core zone of EDFZ Equestrian Venue Asian Games 2018 Pulomas-Jakarta

Location	Rate of mosquito larval density.	Larval Species	Vector standard value
Lakes (46 sites)	0.0	<i>Dragonflies nymph</i> -	Breeding places index:
Water Dispensers (indoor)	5.3	<i>Ae. aegypti</i>	Low = 0
Bathroom (changing room)	8.6	<i>Cx. quinquefasciatus</i>	High > 1
Temporary bathroom	71.4	<i>Cx. quinquefasciatus</i> & <i>Ae. aegypti</i>	(Permenkes No. 70 Tahun 2016)
Flower pots (near tribun)	24.3	<i>Ae. aegypti</i>	
Stagnant water (back area)	5.7	<i>Cx. quinquefasciatus</i>	
Stagnat water (front area)	0.1	<i>Armigeres</i>	
Bromeliad plants	21.4	<i>Ae. aegypti</i>	
Control tank (near tribun)	28.6	<i>Cx. quinquefasciatus</i>	
Stagnant Water Under The Fountain	14.3	<i>Cx. quinquefasciatus</i> & <i>Ae. aegypti</i>	