ประมวลเรื่อง

การประชุมวิชาการทางสัตวแพทย์และการเลี้ยงสัตว์ มหาวิทยาลัยเทคโนโลยีมหานคร

ครั้งที่ ๘ ประจำปี ๒๕๕๗

เรื่อง

สัตวแพทย์เฉพาะทาง: สู่การยกระดับวิชาชีพ กับความต้องการในสังคมไทย?

โดย

คณะสัตวแพทยศาสตร์ มหาวิทยาลัยเทคโนโลยีมหานคร

วันที่ ๑๔ – ๑๕ พฤศจิกายน ๒๕๕๗

ณ อาคาร R คณะสัตวแพทยศาสตร์ มหาวิทยาลัยเทคโนโลยีมหานคร

ประมวลเรื่องการประชุมวิชาการทางสัตวแพทย์และการเลี้ยงสัตว์
มหาวิทยาลัยเทคโนโลยีมหานคร ครั้งที่ ๘ ประจำปี ๒๕๕๗

Proceedings of the 8th MUT Veterinary Annual Conference 2014

ISBN: 978-974-8242-91-0

จำนวนหน้า 46 หน้า

การประชุมวิชาการทางสัตวแพทย์และการเลี้ยงสัตว์ มหาวิทยาลัยเทคโนโลยีมหานคร
ครั้งที่ ๘ ประจำปี ๒๕๕๗
เรื่อง สัตวแพทย์เฉพาะทาง: สู่การยกระดับวิชาชีพกับความต้องการในสังคมไทย?
วันที่ ๑๔-๑๕ พฤศจิกายน ๒๕๕๗
ณ อาคาร R คณะสัตวแพทยศาสตร์ มหาวิทยาลัยเทคโนโลยีมหานคร

จัดโดย **คณะสัตวแพทยศาสตร์ มหาวิทยาลัยเทคโนโลยีมหานคร**

พิมพ์ครั้งที่ 1 **1 (พ.ศ.2557)**

จำนวน **100 เล่ม**

Proceedings of

The 8th MUT Veterinary Annual Conference 2014

Veterinary Specialties Establishment: Professional Requirement versus Society Expectation?

by

Faculty of Veterinary Medicine

Mahanakorn University of Technology

November 14th-15th, 2014

สารบัญ

Application of landscape ecology and epidemiology to assessing potential transmission of filariasis

Prapa Sorosjinda-Nunthawarasilp[1*], Adisak Bhumiratana[2], Suntorn Pimnon[2], Apiradee Intarapuk[3] and Wuthichai Kaewwaen[4]

[1]Department of Fundamentals of Public Health, Faculty of Public Health, Burapha University, Chonburi 20131,Thailand; [2]Department of Parasitology and Entomology, Faculty of Public Health, Mahidol University, 420/1 Rajvithi Road, Rajthewee, Bangkok 10400,Thailand; [3]Department of Clinic, Faculty of Veterinary Medicine, Mahanakorn University of Technology, 140 Cheum-Sampan Road, Nong-Chok, Bangkok 10530,Thailand; [4]Department of Geoinformatics, Faculty of Geoinformatics, Burapha University, Chonburi 20131,Thailand

***Corresponding author: Pradit Sangthong** (prapa@buu.ac.th)

Abstract

[Introduction] Filariasis is one of the mosquito-borne diseases affecting humans and domestic animals. The only lymphatic filariasis causes public health problems in Thailand and Southeast Asia.[1] Brugian filariasis caused by *Brugia malayi* is a zoonotic disease in that domestic animals such as cat and dog are non-human reservoirs. *Brugia pahangi* and *Dirofilaria* spp. also thrives in these natural reservoir hosts. The circulation of filarial parasites in humans and non-human reservoirs does not always permit effective surveillance and xenomonitoring of the filarial infection in filariasis vectors in certain transmission areas or risk areas. Thachana District of Surathani Province in SouthernThailand is a transmission area that had received mass drug administration during 2008 to 2011 from the National Control Program. In this study, we have attempted to apply tools for use in landscape ecology (i.e., determining disease ecotopes) and epidemiology (i.e., determining the prevalence and distribution of filarial infection) of filariasis in this transmission area in the dry season of 2014. Thus, the filarial infections in filariasis vectors were monitored among 4 different disease ecotopes.

[Materials and Methods] Ecotope-based entomological surveillance (EES)[2] was used in determining disease ecotopes (I to IV) based on the abundance and distribution of filariasis vectors on difference in land use/land cover patterns, altitudes, and the vector population replacement within a catchment area of 1.5 km^2 in Phrasong sub-district, Thachana district, Suratthani Province. Among four disease ecotopes, human landing catches were used in indoors/outdoors collection (18:00-21:00 h) of filariasis vectors belonging to genera *Mansonia*, *Culex*, *Aedes*, and *Armigeres*[3-5] although the prevalence and distribution of the filarial infections in filariasis vectors and domestic animals remain unknown. All mosquitoes initially examined by taxonomic identification were individually dissected under stereomicroscopy. Descriptive statistics were used in assessing the positivity of

the filarial infections whether L1, L2, or L3. Species identification of lavae that are positive will be verified by PCR.

[Results] It was clear to note that disease ecotopes I to III exhibited the abundance and distribution of 4 various filariasis vectors; of these, *Ar. subalbatus* distributed widely to all disease ecotopes, whereas *Mansonia* spp. was sessile to the disease ecotope IV. Also, *Ar. subalbatus* was found in disease ecotopes I to III, but not IV, carried the filarial infections, showing the infection rates of 1 to 2.5% (Table 1). However, the intensity of filarial infections was not shown for single disease ecotopes.

[Discussion] Based on determining disease ecotopes of filariasis vectors confined within 1.5 km^2, our findings demonstrated that the magnitude and distribution of filariasis vectors carrying filarial infections (L1/L2/L3) were related to geographically defined ecotopes that are covered with rubber plantations and mixed oil palms and orchards on 60-70 meters above sea level. Ecotopes I to III exhibited the magnitude of the filarial infections carried by *Ar. subalbatus*[5] but not *Mansonia*, *Culex*, and *Aedes* vectors. Ecotope IV proximal to the disturbed peat swamp forest exhibited moderate infestation level for the *Mansonia* but very low infestation level for the *Armigeres*, whereas *Mansonia* did not carry any filarial infections, showing the zero ground of the infection prevalence. This suggests the vector population replacement occurred in disease ecotopes I to III as *Ar. subalbatus* plays more important role as a vector of zoonotic filariasis.[5] Nonetheless, the further investigation of the relative disease ecotopes is needed to determine the extent to which the potential transmission of filariasis including *B. malayi* and *B. pahangi* is regulated by the vector population replacement, season variations, animal reservoirs, human settlements and activities, and land use/land cover changes.

References

1. Bhumiratana A, Intarapuk A, Koyadun S, Maneekan P, Sorosjinda-Nunthawarasilp P. Current bancroftian filariasis elimination on Thailand-Myanmar border: Public health challenges toward postgenomic MDA evaluation. ISRN Trop Med, 2013; 2013: 857935.

2. Sorosjinda-Nunthawarasilp P, Bhumiratana A. Ecotope-based entomological surveillance and molecular xenomonitoring of multidrug resistant malaria parasites in *Anopheles* vectors. Interdiscip Perspect Infect Dis, 2014; 2014: 969531.

3. Apiwathnasorn C, Samung Y, Prommongkol S, Asavanich A, Komalamisara N, Mccall P. Bionomics studies of *Mansonia* mosquitoes inhabiting the peat swamp forest. Southeast Asian J Trop Med Public Health, 2006; 37(2): 272-278.

4. Entomological survey in “Phru Nam Dum” Surathani, Thailand. J Vector-borne Dis, 2008; 7(1): 1-7.

5. Muslim A, Fong MY, Mahmud R, Lau YL, Sivanandam S. *Armigeres subalbatus* incriminated as a vector of zoonotic *Brugia pahangi* filariasis in suburban Kuala Lumpur, Peninsular Malaysia. Parasit Vectors, 2013; 6: 219.

Keywords: Filariasis, Ecotope-based entomological surveillance, Landscape ecology, Epidemiology

Table 1 Prevalence and distribution of filarial infections in filariasis vectors among four disease ecotopes[a]

Disease ecotope	*Mansonia*		*Culex*		*Aedes*		*Armigeres*	
	Total no.	**No. positive (%)**	**Total no.**	**No. positive (%)**	**Total no.**	**No. positive (%)**	**Total no.**	**No. positive (%)**
I	0	0	27	0	1	0	133	2 (1.5)
II	2	0	0	0	7	0	175	2 (1.1)
III	0	0	30	0	8	0	40	1 (2.5)
IV	34	0	6	0	0	0	5	0

[a]Data were obtained from 3 consecutive days of mosquito collection using human landing catches in single disease ecotopes.

Mansonia mosquitoes parasitized by water mites in Narathiwat province, Southern Thailand

Suntorn Pimnon[1*], Prapa Sorosjinda-Nunthawarasilp[2],
Apiradee Intarapuk[3] and Adisak Bhumiratana[1]

[1]Department of Parasitology and Entomology, Faculty of Public Health, Mahidol University, Bangkok 10400, Thailand; [2]Department of Fundamentals of Public Health, Faculty of Public Health, Burapha University, Chonburi 20131, Thailand; [3]Department of Clinic, Faculty of Veterinary Medicine, Mahanakorn University of Technology, 140 Cheum-Sampan Road, Nong-Chok, Bangkok 10530,Thailand

***Corresponding author: Suntorn Pimnon** (suntorn.pim@mahidol.ac.th)

Abstract

[Introduction] Water mites such as larval *Arrenurus spp.* can affect both survival and reproduction of mosquito hosts belonging to Family Culicidae (Insecta: Diptera).[1] For example, filariasis vectors belonging two genera *Coquillettidia* and *Mansonia* are parasitized by *Arrenurus danbyensis* and, consequently, they had a significant effect on the mosquito's egg production or they have been eliminated by heavy infestations of water mites. The impact of parasitism on the filariasis vector populations has never been observed.

This study was to determine the abundance and distribution of water mites that parasitized *Mansonia* spp. mosquitoes endogenous to “Toh Daeng” peat swamp forest in Tak Bai district, Narathiwat province, Southern Thailand.

[Materials and Methods] Ecotope-based entomological surveillance (EES)[2] was used to collect adult mosquitoes of *Mansonia* spp. that infest filariasis ecotopes in “Toh Daeng” peat swamp forest in Tak Bai district, Narathiwat province during the dry season in 2014. The adult mosquito samples were collected both indoors and outdoors by using human landing catches between 18:00 and 21:00 h. Then, the mosquitoes were individually examined for the taxonomic identification under stereomicroscopy as well as the presence of larval water mites. In this study morphologic characteristics of larva water mite are not taxonomically identified for the species. The abundance and distribution of water mites found on any *Mansonia* mosquitoes were recorded based on the infestation at head, thorax and abdomen.

[Results] A total of 372 adult *Mansonia* mosquitoes found in this study included 192 *Ma uniformis*, 173 *Ma. bonneae*, 5 *Ma. annulata*, one *Ma. dives*, and one *Ma. indiana*. Of these, only two major taxa including 19 (9.9%) *Ma. uniformis* and 8 (4.6%) *Ma. bonneae* were parasitized by larval water mites. On the other hand, a total number of 61 water mites infested these taxa were observed; 50 (82.0% infestation) mites on *Ma. uniformis* and 11 (18.0% infestation) on *Ma. bonneae*, as shown in Table 1. Parasitism of both *Ma. uniformis* and *Ma. bonneae* was mostly found on the thorax (Figure 1). No water mite was found on

the proboscis or head part of these mosquitoes.

[Discussion] However, lavar water mite that are preference to Mansonia vectors remain unclear. *Ma.uniformis* and *Ma.bonneae* were likely to show the infestation of larval water mites in this study. The Difference is the infestation level of water mites; the infestation on *Ma.uniformis* was greater than that *of Ma.bonneae*. This might suggest specific host preference of parasitism occurring in *Ma. uniformis taxa*. The significance of the high infestation in *Ma. uniformis* is needed for further investigation whether it has the effect on changes in the population or community structure or it exhibits the role in biological control of filariasis vectors in the study area.[3,4]

References

1. Smith BP, McIver SB. The impact of *Arrenurus danbyensis* Mullen (Acari: Prostigmata; Arrenuridae) on a population of *Coquillettidia perturbans* (Walker) (Diptera: Culicidae). Canadian J Zool 1984; 62: 1121-1134.

2. Sorosjinda-Nunthawarasilp P, Bhumiratana A. Interdiscip Perspect Infect Dis, 2014; 2014: 969531.

3. Rajendran R, Prasad RS. J Biosci, 1992; 17: 35-40.

4. Apiwathnason C. et al., 2006. Southeast Asian J Trop Med Public Health 2006; 37: 278-282.

Keywords: *Mansonia uniformis*, *Mansonia bonneae,* water mites, infestation.

Table 1 Infestation of larval water mites on *Ma. uniformis* and *Ma. bonneae*

Time[a]	No. of mites on *Ma. uniformis* (n=19)				No. of mites on *Ma. bonneae* (n=8)			
	Head	Thorax	Abdomen	Total	Head	Thorax	Abdomen	Total
1 h	0	4	2	6	0	3	0	3
2 h	0	21	4	25	0	7	0	7
3 h	0	14	5	19	0	1	0	1
Total	0	39	11	50	0	11	0	11

[a]Peak density of *Mansonia* spp.

Figure1 Infestation of larval water mites on *Ma.uniformis* (A) and *Ma.bonneae* (B).