

Asian Pacific Journal of Tropical Disease

journal homepage: <http://www.apjtdm.com>



Mini-review <https://doi.org/10.12980/apjtd.7.2017D7-27>

©2017 by the Asian Pacific Journal of Tropical Disease. All rights reserved.

Bat related virus infection: A summary on reports from Thailand

Beuy Joob^{1*}, Viroj Wiwanitkit^{2,3,4,5}

¹Sanitation 1 Medical Academic Center, Bangkok, Thailand

²Hainan Medical University, Haikou, China

³Dr DY Patil University, Pune, India

⁴Faculty of Medicine, University of Nis, Nis, Serbia

⁵Joseph Ayobabalola University, Ikeji-Arakeji, Nigeria

ARTICLE INFO

Article history:

Received 9 Feb 2017

Accepted 16 Apr 2017

Available online 31 May 2017

Keywords:

Bat

Infection

Virus

Southeast Asia

ABSTRACT

Bat is an interesting mammal that can fly. The disease of human beings relating to bat is very interesting but limited mentioned. There are many virus infections that can be transmitted to human beings by bat. Those virus infections are usually serious and difficult to manage. In this mini-review, the authors hereby summarize and discuss on the bat related virus infection mentioned in the previous publications in Thailand, a tropical country in Southeast Asia.

1. Introduction

There are many mammals in the world, and bat is the extremely interesting that can fly and have it daily life at night. Bat normally lives in groups in humid places such as caves, hence, bat is easily exposed to several pathogen. The bat might carry the pathogen and can further transmit it to infect other animals including to human beings. The bat related virus infection is an interesting group of viral infection that is little mentioned in the literature. In fact, there are many virus infections that can be transmitted to human beings by bat. Those virus infections are usually serious. The infected cases are usually difficult to be diagnosed and managed. In this mini-review, the authors hereby summarize and discuss on the bat related virus infection mentioned in the previous publications in Thailand, a tropical country in Southeast Asia.

2. Bat rabies

Rabies can be transmitted by any mammals including to bat. Bat

rabies is an interesting situation that can be seen in tropical countries[1,2]. As noted by Wilde and Lumlertdacha[1], bat rabies is possible but usually neglected. In Thailand, there are some previous reports regarding bat rabies. Most reports are the study on virus contamination and metagenomics study on environmental samples. Robertson *et al.* noted for “the need for educational outreach to raise awareness of bat rabies, promote exposure prevention, and ensure appropriate health-seeking behaviors for bat-inflicted wounds, particularly among at-risk groups in Thailand[3].”

3. Nipah virus infection

Nipah virus is the specific emerging virus infection with its first observation in Southeast Asia. The virus can also be seen in bat in Thailand[4]. Wacharapluesadee *et al.* performed a metagenomics study on bats' urine samples from Thailand and noted that, in Thailand, “the Bangladesh strain was almost exclusively detected during April to June. The Malaysian strain was found dispersed during December to June[5].” Wacharapluesadee *et al.* also noted that “Greater virus shedding over extended periods in the case of the Malaysian strain and the highest peak of virus detection in May in the

*Corresponding author: Beuy Joob, Sanitation 1 Medical Academic Center, Bangkok, Thailand.

E-mail: beuyjoob@hotmail.com

The journal implements double-blind peer review practiced by specially invited international editorial board members.

case of the Bangladesh strain when offspring started to separate may suggest that there may be responsible mechanisms other than direct contact during breeding in the same roost[5].” In Thailand, *Pteropus* bats are the major natural reservoirs of Nipah virus and there is a potential for disease outbreak[6,7]. Thanapongtharm *et al.* noted for possible “zoonotic transmission of Nipah” and the requirement of “human and animal health surveillance[8].” To correspond to the need of diagnostic test for surveillance, the local researchers already intervened and proposed a new duplex nested RT-PCR for detection of Nipah virus RNA from urine specimens of bats[9]. Nevertheless, until present, there is still no case of Nipah virus infection induced encephalitis in Thailand[10]. The existence of pathogen in bat is of great risk for public health concern.

4. Kaeng Khoi virus infection

Kaeng Khoi virus is the specific human pathogenic virus firstly seen in bat from cave in Thailand. It is presently seen in other countries in Southeast Asia (such as Cambodia[11]) and other tropical areas of the world[12].

5. Coronavirus (CoVs) infection

CoVs is the main pathogen causing severe acute respiratory syndrome (SARS) that is the recent worldwide epidemic problem. The CoVs can be detected in several bat species from Thailand, China and nearby countries (Indonesia, Taiwan and the Philippines)[13]. Wacharapluesadee *et al.* performed a metagenomics study and reported for finding of group C betacoronavirus in bat guano fertilizer in Thailand[14]. Nevertheless, there is still no reported case of SARS due to CoVs from bats in Thailand .

6. Conclusion

The contamination of human pathogenic virus in bat and environmental samples relating to bat is confirmed in Thailand. Although there is still no outbreak of bat related virus infection, it is highly recommended for strict disease surveillance for possible emerging new zoonosis from bat in this area.

Conflict of interest statement

We declare that we have no conflict of interest.

References

- [1] Wilde H, Lumlertdacha B. Rabies research in resource-poor countries. *Adv Virus Res* 2011; **79**: 449-55.
- [2] Hemachudha T, Phuapradit P. Rabies. *Curr Opin Neurol* 1997; **10**(3): 260-7.
- [3] Robertson K, Lumlertdacha B, Franka R, Petersen B, Bhengsri S, Henchaichon S, et al. Rabies-related knowledge and practices among persons at risk of bat exposures in Thailand. *PLoS Negl Trop Dis* 2011; **5**(6): e1054.
- [4] Wacharapluesadee S, Lumlertdacha B, Boongird K, Wanghongsa S, Chanhom L, Rollin P, et al. Bat Nipah virus, Thailand. *Emerg Infect Dis* 2005; **11**(12): 1949-51.
- [5] Wacharapluesadee S, Boongird K, Wanghongsa S, Ratanasetyuth N, Supavonwong P, Saengsen D, et al. A longitudinal study of the prevalence of Nipah virus in *Pteropus lylei* bats in Thailand: evidence for seasonal preference in disease transmission. *Vector Borne Zoonotic Dis* 2010; **10**(2): 183-90.
- [6] Wacharapluesadee S, Samseeneam P, Phempool M, Kaewpom T, Rodpan A, Maneern P, et al. Molecular characterization of Nipah virus from *Pteropus hypomelanus* in Southern Thailand. *Virology* 2016; **13**: 53.
- [7] Gay N, Olival KJ, Bumrungsri S, Siriaroonrat B, Bourgarel M, Morand S. Parasite and viral species richness of Southeast Asian bats: Fragmentation of area distribution matters. *Int J Parasitol Parasites Wildl* 2014; **3**(2): 161-70.
- [8] Thanapongtharm W, Linard C, Wiriyarat W, Chinsorn P, Kanchanasaka B, Xiao X, et al. Spatial characterization of colonies of the flying fox bat, a carrier of Nipah virus in Thailand. *BMC Vet Res* 2015; **11**: 81.
- [9] Wacharapluesadee S, Hemachudha T. Duplex nested RT-PCR for detection of Nipah virus RNA from urine specimens of bats. *J Virol Methods* 2007; **141**(1): 97-101.
- [10] Olsen SJ, Campbell AP, Supawat K, Liamsuwan S, Chotpitayasunondh T, Laptikulthum S, et al. Infectious causes of encephalitis and meningoencephalitis in Thailand, 2003–2005. *Emerg Infect Dis* 2015; **21**(2): 280-9.
- [11] Osborne JC, Rupprecht CE, Olson JG, Ksiazek TG, Rollin PE, Niezgodka M, et al. Isolation of Kaeng Khoi virus from dead *Chaerephon plicata* bats in Cambodia. *J Gen Virol* 2003; **84**(Pt 10): 2685-9.
- [12] Groseth A, Mampilli V, Weisend C, Dahlstrom E, Porcella SF, Russell BJ, et al. Molecular characterization of human pathogenic bunyaviruses of the Nyando and Bwamba/Pongola virus groups leads to the genetic identification of Mojuí dos Campos and Kaeng Khoi virus. *PLoS Negl Trop Dis* 2014; **8**(9): e3147.
- [13] Wacharapluesadee S, Duengkae P, Rodpan A, Kaewpom T, Maneern P, Kanchanasaka B, et al. Diversity of coronavirus in bats from Eastern Thailand. *Virology* 2015; **12**: 57.
- [14] Wacharapluesadee S, Sintunawa C, Kaewpom T, Khongnomnan K, Olival KJ, Epstein JH, et al. Group C betacoronavirus in bat guano fertilizer, Thailand. *Emerg Infect Dis* 2013; **19**(8): 1349-51.

[1] Wilde H, Lumlertdacha B. Rabies research in resource-poor