CONFERENCE PROCEEDING

Investigation of Blood Parasites of Birds and Rodents at Tasik Abrar Universiti Sains Islam Malaysia

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Abstract

Rodent and birds are the common hosts for parasites especially blood parasites and the important vectors in carrying diseases. Some of the parasites that carried by these rodents and birds that had significant importance such as triggering diseases are *Babesia* sp., *Hepatozoon* sp. and *Trypanosoma* sp. The study was carried out in a lake located in Universiti Sains Islam Malaysia campus. The rodents were trapped by using cage trap and baited with palm oil seed. Birds were captured using mist nets. The blood was extracted from the tail of trapped rodents and birds. Many thin layers of blood smears were obtained and brought for examination. The study reveals the presence of several blood parasites that commonly found in rodents that can be observed under microscopic observation. The findings show that the intensive documentation should be conducted for better campus landscape management.

Keywords: *Rodentia order, birds, blood smear, parasites*

INTRODUCTION

Rodents and birds are the widespread reservoirs and hosts in carrying pathogens and zoonotic diseases (Baltrūnaitė *et al*., 2019). The main contributors to the evolution and emergence of rodent-borne diseases are the environmental changes such as major human population growth and constant human intrusion into animal's habitat. No wonder 1 billion cases of human afflicted by zoonotic diseases and increasing year by year (Karesh *et al.*, 2012). Some of the agents that were responsible in bringing the rodent-borne diseases are *Trypanosoma, Babesia and Hepatozoon*. The diseases might be spread through the complete interactions between the hosts, pathogens and vectors (Baltrūnaitė *et al*.,2019). Beside rodent, major birds are the renowned host in bringing the parasites. They are infected by a number of intracellular blood parasites, including Haemosporidia of the genera *Plasmodium*, *Haemoproteus* and *Leucocytozoon* (Quillfeldt *et al*., 2011).

Studies should therefore be focused on investigations of the distribution and prevalence of zoonotic pathogens in their wildlife reservoirs. Plus, it is important to identify different parasite communities circulating in these reservoir hosts. Scientific papers describe different methods or protocols, which can lead to a variety of results

and interpretations. To allow fast and near to accurate parasite identifications, some modifications have been made such as shorten the time for blood staining and release the host after taking their blood samples (Baltrūnaitė *et al*., 2019).

Most outbreaks of rodent-borne diseases are commonly related to socio-economics factors such as overcrowding and poor-hygiene (Daniel *et al*., 1992). In this study, the location we have been chosen are at one of the lake in the Universiti Sains Islam Malaysia Campus, which the isolated bushy lakes behind a college. In this study, we used the microscopy observation to investigate the diversity and prevalence of blood parasites in small mammals, namely the *Toxoplasma, Babesia, Hepatozoon* and *Trypanosoma* genera at the Tasik Abrar, and to evaluate the appropriate morphological for the reliable determination of these parasites.

MATERIALS AND METHODS

Sampling Site

Sample collection site that have been chosen was a lake in Universiti Sains Islam Malaysia, Abrar Lake located in GENIUS Insan College. This lake is the biggest among other lakes in the university. As it was isolated with the college buildings and have bushy environment, there were many wild rodents and birds such as rats, dove and tree shrews.

Sample Collection and Parasites Identification

Rodents traps were baited with one of these baits such as sweet potatoes with peanut butter, salted fish and oil palm fruits. Special type of aromatic banana also will be used as all these baits were shown can attract most of the small mammals such as rodents and squirrel. (Ishak *et al*., 2018). Mist net were used in capturing birds (Bennett *et al.,* 1960). The rodents and bird blood samples were taken by cutting any part of their body such as tail and taken using syringes. The blood then spread on glass slides then thin blood smears were prepared with proper blood-smearing protocol (Baltrūnaitė *et al*,2019).

All the blood smears prepared were stained by 10ml Giemsa solution which then were added with 100ml distilled water (1:10 dilution). The smears were then stained for 15 minutes each, which then rinsed by 100ml distilled water for 1 minutes. All the stained smears undergo microscopy observation with the Labomed CXL Binocular Microscope. 4x, 10x, 40x and 100x magnifications using immersion oil applied to get clearer results and want to identify parasites more accurately.

RESULTS AND DISCUSSION

Table 1. Prevalence of blood parasites in rodents at Tasik Abrar

Host species	No. of tested rodents	Prevalence of parasites (%)			
		Babesia sp.	Toxoplasma sp	Trypanosoma sp	Hepatozoon sp.

Rattus tiomanicus	3	23	45	32	46
Rattus rattus	1	33	34	12	20
Tupaia glis	2	32	55	6	21

Table 2. Prevalence of blood parasites in birds at Tasik Abrar

Host species	No. of tested birds	Prevalence of parasites (%)		
		Leucocytozoon sp.	Haemoproteus sp.	Trypanosoma sp
Geopelia striata	2	13	34	9
Copsychus saularis	2	2	24	12

CONCLUSION

The occurrences of the parasites that we found showed that there were transmissions between host plus it also explains there were interactions between rodents and between birds. However, the presence of parasites such as *Trypanosoma sp*. in these hosts is surprisingly have least amount among other rodent's parasitology studies. The environment at Tasik Abrar may intrude the *Trypanosoma*'s living factors because they frequently lived in hot climate habitats (Katakweba *et al*., 2012).

In this case, the most two parasites that live within the hosts and Tasik Abrar are *Babesia sp. and Toxoplasma sp.* The number of parasites found within the hosts that have been collected doesn't show the abundance of the living parasites within the organisms at Tasik Abrar, Universiti Sains Islam Malaysia. This showed that the lake has reduced rodent-borne diseases risks. Overall, the hosts we collected doesn't enough to fully conclude that the lake is free from any zoonotic diseases.

ACKNOWLEDGEMENT

We would like to thank Kolej GENIUS Insan, Universiti Sains Islam Malaysia for providing us a wide range of research equipment.

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