

Detection and molecular identification of blood parasites in rodents captured from urban areas of southern Sarawak, Malaysian Borneo

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Abstract

Background: Rodent species are well known for their potential as hosts and reservoirs for various zoonotic diseases. Studies on blood parasite infection in small mammals focused on urban cities in Peninsular Malaysia and have been conducted over the years. In contrast, there are information gaps related to molecular detection of blood parasites in urban areas of Sarawak that are associated with veterinary importance and zoonotic spillover potential. Increasing prevalence and transmission of blood parasite diseases is the most crucial public health issue, particularly in developing urban areas of Sarawak. Therefore, molecular identification studies were performed to determine and identify the blood parasites infecting rodents.

Methods: A total of 40 rodent blood samples were analysed for blood parasite infection and a combined approach using polymerase chain reaction-based technique, and traditional microscopic examination (blood smear test) was conducted. 18s rRNA (*Plasmodium* spp.) and cytochrome b (*Hepatocystis* spp.) gene marker were used to identify the blood parasites.

Results: Note that 67.5% ($n = 27$) blood samples were tested negative for blood parasites, while 32.5% ($n = 13$) blood samples collected were infected with at least one protozoan parasite. Out of 13 samples, 69.2% ($n = 9$) were detected with *Hepatocystis* sp., while 15.4% ($n = 2$) were positive with *Hepatozoon ophisauri*. Two individuals had multiple infections from both species. No *Plasmodium* spp. have been detected throughout this study using universal primer (targeted *Plasmodium* spp.); however, different parasite species which were *H. ophisauri* were detected.

Conclusion: Although there is no evidence of human infection from *H. ophisauri* and *Hepatocystis* sp. detected from the study, the data show the host species are heavily infected, and the information is essential for future prevention of zoonotic outbreaks and surveillance programmes. Therefore, it is suggested that the surveillance